

LANDSCAPING KANSAS HOME GROUNDS

by

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The home of
PROFESSOR AND MRS. A. B. SPERRY
Manhattan, Kansas.

INTRODUCTION

It is the purpose of this thesis to provide a basic understanding of how the average Kansas home, whether urban or rural, may be so landscaped as to provide a maximum of usefulness and enjoyment.

Many Kansans relegate this problem to a minor place in their home life plans when a little exertion, properly directed, would result in benefits far in excess of the effort required. Modern living tends to provide more leisure time. The manner in which this time is spent will help pattern the future of the nation. Surely, some time spent on planning, planting, and maintenance of a home grounds will make it convenient and attractive, and will certainly add to the family's enjoyment of the home surroundings. This, in turn, will contribute a great deal toward a better home life for all.

The subject is introduced by discussion of a topic familiar to every Kansan--the natural beauties of the country landscape. This leads into consideration of the chief reasons for landscaping the home grounds, one of which is to so plan the house and grounds that they are properly related to each other and are as convenient as possible for every-day living. The other major consideration is to make the area an attractive one through the use of beautiful trees, shrubs, flowers, and appropriate garden accessories.

An understanding of these reasons facilitates the necessary steps that follow. The first is to clean up the entire area. Next, a map of existing conditions is prepared as a basis for

planning. The study then proceeds to the subject of the landscape plan itself, including the division of the grounds into use areas, grading and drainage, and the use of plant material and garden accessories. A model solution of these points, based on a specific problem, is presented to aid in understanding the application of the principles discussed. Following this general discussion, the specific problems of city and rural home grounds in Kansas are treated separately.

The selection of plants suitable for Kansas and how they should be planted and maintained, precedes a representative list of plant materials recommended for landscape use within the state.

All major points are illustrated and the text has been kept as untechnical and readable as possible with the idea in mind that it may contribute in some measure toward material for a bulletin on this subject, as there is at the present time no such publication available to the citizens of Kansas.

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APPRECIATION OF NATURAL BEAUTY

Kansas was endowed with a beautiful landscape by nature, the master designer. She was provided with sweeping prairies extending as far as the eye can see. This waving green ocean of grass is the lawn of her Kansas home. The forest stands of the east and the shelter-belts of the west help to supply shade and shelter. The undergrowth of the river valleys and hillsides furnishes her with shrubs. Color is added by the thousands of flowering plants of woodland and prairie.

Nature, like the landscape architect, is utilitarian and demands usefulness as well as beauty. The grasslands contribute feed for livestock and a home for the meadowlark and quail. The forests supply lumber and firewood as well as protection to wildlife. Both grasses and trees serve as a bulwark against the eroding influences of wind and rain. By their very usefulness they add further to the natural beauties of the countryside.

Many of the native plants of Kansas are very desirable from the landscape point of view, having beautiful flowers or attractive foliage or both. In addition, they have passed the test of time, having proved themselves adaptable to that part of Kansas where they normally grow. This point is one that should be carefully considered when selecting material for planting.

Every Kansan should contribute in some way to the perpetuation of this native plant material responsible for the beauty of the countryside, not only for the sake of its beauty but because of its usefulness as well. Combating soil erosion,

which robs the state of much valuable land each year, and providing shelter for wildlife are two very real reasons this should be done. Most people are fully aware of the need for such conservation measures through the work of the U.S. Department of Agriculture, the Biological Survey, Kansas State Colleges, and their own realization of its worth. Youth organizations such as the 4-H Club, Future Farmers of America, and Scouts, to mention only a few, are vitally interested in such matters, and rightly so. Theirs will be the loss if this important work is not done. Ours, and theirs, will be the profit if it is done. One need only mention "the dust bowl" and dust storms to anyone from the middle west to bring to mind why the soil must be kept covered with crops or natural vegetation.

It logically follows that if existing native plant material is maintained or more is planted as a soil conservation measure, shelter and food will automatically be provided, in part at least, for wildlife. Everyone appreciates the song of the meadowlark, and the aid of all insectivorous birds as well as other forms of wildlife, without which life would be much less interesting. To have a shade tree is fine, but to add a mockingbird is wonderful.

Every farm, roadside, city park, and home has a place where plantings for wildlife can, and should, be made. Many farms contain eroding gullies, streams, or rocky waste places where plantings for conservation of both soil and wildlife would be appropriate. Roadside plantings that harmonize with the native vegetation serve the additional purpose of beautifying the

highway. Plantings in the park and about the home provide nesting places for birds in addition to fulfilling their primary purpose.

Proper attention to these general considerations will make Kansas a better place in which to live, and the improvement to Kansas in general will be reflected in Kansas home grounds.

REASONS FOR LANDSCAPING

A beautiful yard is included in the thoughts of everyone as he plans his home. He visualizes a carpet of green lawn, an attractive house surrounded by groups of fine shrubs and cheerful flowers, and a sheltering shade tree or two to ward off the summer sun. Amid such pleasant surroundings his life will be richer--fuller.

In order to bring this thought into being for every Kansan a certain amount of planning and planting is required. It is the purpose of this study to provide a basic understanding of how the average Kansas home may be so landscaped as to provide a maximum of usefulness and enjoyment. The increase in value is not only aesthetic, but can also be counted in dollars and cents.

A well landscaped home is a source of great comfort and enjoyment to its owner because it is both convenient and attractive. The need for more interest in landscaping is everywhere apparent, and an understanding of the entire problem is essential before any part of it is undertaken.

Utility

"Making the home pretty by planting some nice bushes and flowers" seems to be the popular conception of landscaping. Actually, the first consideration of the designer is to provide for the convenience of the people involved. This should be done before the house is built, while everything is in the planning stage. Usually people purchase their grounds in a desirable location and plan a house to fit the grounds. Here is where a knowledge of both landscape design and architectural design is necessary. Armed with such knowledge one can plan the house to fit the grounds, so that the best possible relationship can be worked out between the indoor and outdoor living and service areas. All too often a fine house is constructed on a good location with little or no thought given to this point, and as a result, the maximum of convenience and enjoyment is never realized. Those who plan their own houses and yards should be properly cognizant of this essential object. They should become familiar with the principles of designing useful grounds before the house is planned and located on those grounds. The house can then be located on the best site in relation to the grounds.

The details of providing this convenience will be discussed in full later and will be only mentioned at this point. They include locating secondary buildings such as the garage, planning walks and drives for efficient circulation, and providing service areas such as the kitchen garden and drying yard. These are things that once done probably will remain unchanged for years

end therefore should be well thought out beforehand. Make them right the first time.

Attractiveness

To make one's home attractive is a desire almost as old as homemaking itself in the American scheme of things. The hard-working Pilgrim wife made time available to grow a few flowers to remind her of the old home across the sea. In a like manner, the pioneer housewife made an effort to beautify her home and home on the Kansas prairies by growing vines over it. Today, not only the womenfolk but also the men, who have more leisure time whether they be farmers or city dwellers, are becoming more interested in having an attractive home in a charming setting of trees and shrubs. The elderly find peace and relaxation amid beautiful surroundings while their children grow up with a love for the physical aspects of their home. Pleasant surroundings contribute to a cheerful and more comfortable mode of living. Pride of ownership increases proportionately to the amount of planning and doing that goes into the home landscape, while the value of the property increases many times over the relatively small amount expended.

CLEAN UP THE AREA

The first operation is to clean up the home grounds. Neat, orderly grounds are a necessary initial step toward a well-landscaped home. All unsightly objects, trash, weeds, rocks, tin cans, and similar material should be removed. Inspect

existing trees and shrubs to see if any are usable. Some may be useful where they stand; others can perhaps be moved to new, better locations after the landscape plan is developed. Prune, and remove all dead branches from such plants, and grub out any that are diseased or broken down. Trash and brush should not be piled on the ground and burned where plants of any kind will be grown, as the heat of the fire is injurious to the soil.

If the problem is one involving an existing house, do any necessary repairing and painting. Include secondary buildings and fences in the program, so that everything will look as nice as possible before actual planning and planting begins.

MAP EXISTING CONDITIONS

This study, as well as the following one on the development of the landscape plan, will be dealt with in so far as possible in broad terms applicable to both city and farm homes. Later, the specific problems of each will be considered separately.

The second operation is to prepare a map of the grounds as they exist. This is necessary as a basis for the landscape plan to be drawn up later. This can be drawn on plain drawing paper or on cross-section paper. If the latter is used, a scale can be set up allotting a certain number of feet to each small square according to the size of the grounds and the size of the plan desired. The scale should be checked to be sure the largest dimension of the grounds will fit upon the paper to be used. For example, if it is decided that each small square is to represent two feet on each side and the length of the yard is

found to be 150 feet, then that length will be represented by seventy-five squares on the cross-section paper.

If plain drawing paper is used, then a scale of a certain number of feet per inch should be decided upon. For example, if a scale of one inch equals fifteen feet is used, then the length of the 150 foot yard would be drawn on paper as a ten inch line. The first step is to record on the map the boundaries of the grounds--front, sides, and rear. These can then be used as base lines from which to plot other objects. All significant existing features are plotted in their proper places. They can be located by checking the distance from the street and one side, for example.

If work is to be done around an existing house, then that house should be plotted with doors and windows indicated. The garage, drives, walks, trees, shrubs, and fences are next. Existing water, sewer, and gas lines should be indicated by dotted lines and kept in mind when planning and planting. Any significant changes in elevation, such as terraces or ditches, should be noted. If the area is devoid of buildings then only objects or conditions which are more or less permanent are indicated.

A model solution to a specific problem of home ground development will be used throughout the general discussion to follow, to serve as a concrete illustration of the steps involved.

Mr. X acquired a home site on the outskirts of a medium-sized city in Kansas. It is in an area which will provide a

good neighborhood atmosphere, access to schools, etc., all utilities, and is within easy driving distance of downtown and work. The plot faces east and is 100 by 150 feet in size. This is large enough for the twenty by forty foot house the family has in mind and will fill its other requirements as well. Besides Mr. and Mrs. X there are two boys, five and eleven years of age. The members of the family enjoy the out-of-doors and gardening and they plan to have a rose garden, outdoor fireplace, and a vegetable garden. After cleaning up the area they set to work to draw a map (Plate I) and locate the significant features such as the cherry trees, the two terraces, the two elms, the group of catalpas, and the boundaries.

DEVELOP A LANDSCAPE PLAN

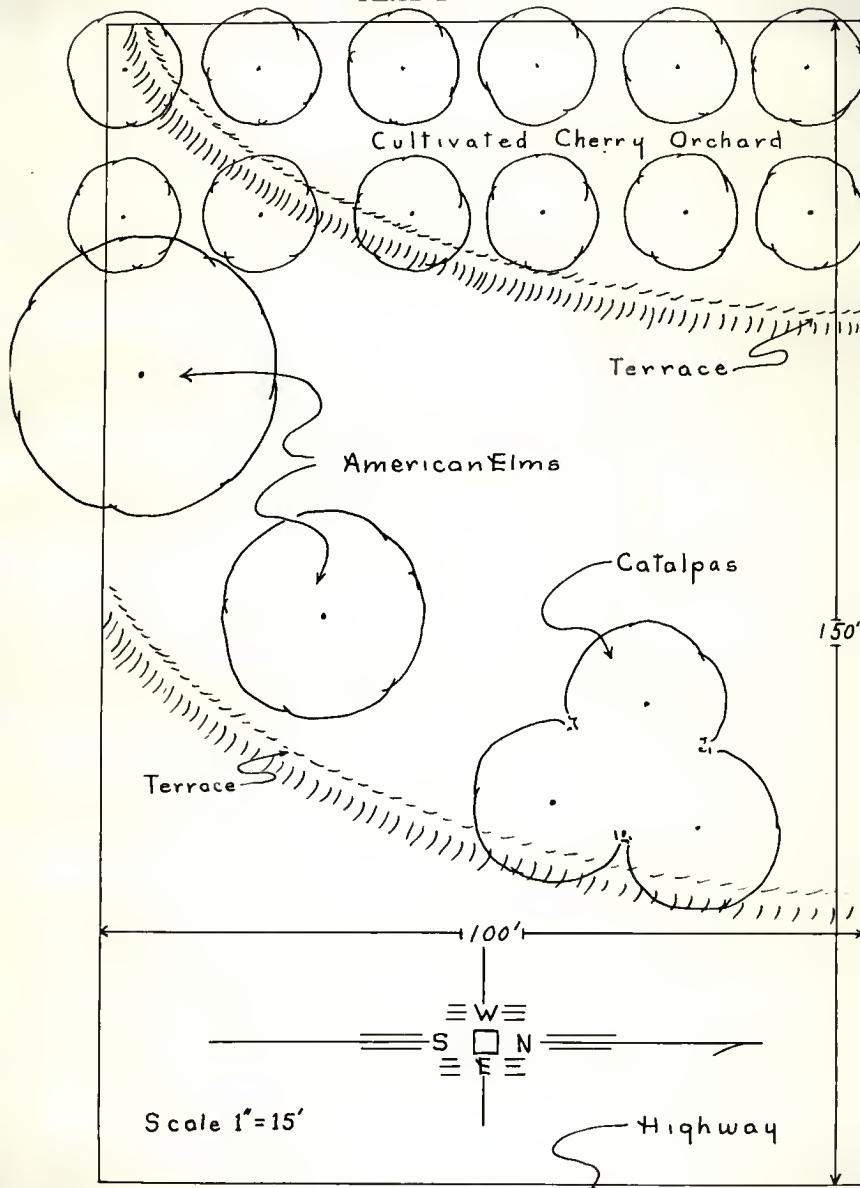
Every successful person, regardless of his job, follows a plan of some sort. A good plan is the result of a great deal of study and consideration.

The highway engineer, before building a bridge, studies the site, the traffic and load requirements of the highway, and then plans a bridge that will fulfill those requirements. Before a bulldozer scratches the soil the entire bridge is drawn to scale on the drafting board. Perhaps several plans are drawn and analyzed and the best one is selected. That plan shows the size and location of every girder, brace, and rivet to those who assemble it. When the bridge is completed it is strong and useful and will serve for many years.

Likewise, the landscape architect studies the home site,

EXPLANATION OF PLATE I

A map of conditions existing on the model homesite.



the needs and desires of the family concerned, and prepares a landscape plan that meets those requirements. Each home is a specific problem that can best be solved by individual attention. Before a spade turns the soil, the entire landscape design is drawn to scale on the drafting board. In the course of considering the problem, several alternate studies may be made, and the family, together with the landscape architect, selects the one most desirable. The plan selected is elaborated upon to show the location of every tree, shrub, flower bed, walk, and drive, in relation to the house. When transferred to the grounds, by planting and construction, this becomes a living design that is both useful and attractive, and one that will grow and improve with the passing years. Its fulfillment may be so arranged as to fit into any budget and be distributed over several years.

Division of the Area for Convenience and Attractiveness

The home owner, having selected a good building site in a pleasant neighborhood, is ready to begin one of life's greatest adventures--building a home. The landscape problem is best understood when dealing with a new house. Those who buy or own an existing house, however, will find that a knowledge of the subjects about to be discussed will be helpful in remodeling and rearranging. Both those who buy and those who build should be familiar with all of the factors to be discussed, whether they intend to do their own landscaping or hire a professional landscape architect. The interrelation of all the parts of a landscape design can hardly be overemphasized and should be

thoroughly understood before a decision is reached on any one part of the general plan.

Orientation. Placing the house in reference to direction is one point that is often given little consideration. Many people prefer to have their houses "square with the world"; that is, facing directly into one of the four cardinal points of the compass. It has been determined, however, that to turn the house to face between those points--southeast rather than south or east, for example--places it in a position to receive the benefit of sunlight on all four sides of the house during part of the year, at least. New subdivisions with circular drives have many of the homes so placed. This, of course, cannot be accomplished in a limited space nor does it look well to have such a house close to others facing in the conventional manner. Such orientation can be done only on ample grounds or where it fits into the general plan. It is purely a matter of personal preference to be decided upon by the family as to how the building shall be oriented. This should be considered before the grounds are purchased. However, if the grounds are large enough, it is possible to have a house facing to the right or left rather than toward the street or road.

Many have found it quite feasible to place the principle rooms for best exposure even if this necessitates their being at the rear of the house. In any case, the living rooms of the house should be adjacent to the outdoor living areas such as the terrace or garden. They should be so located as to have the most pleasant exposure at those times of the year, and of the day,

when they will be used most. Such decision is based on the personal desires of the family.

Turning to our example (Plate II), we find that Mr. X placed the living room on the south, where in the summer it receives the southerly breezes, and in the winter the welcome warmth of the sun. The front of the house has an eastern exposure which gives it morning sun for cheerfulness, and shade in the afternoon.

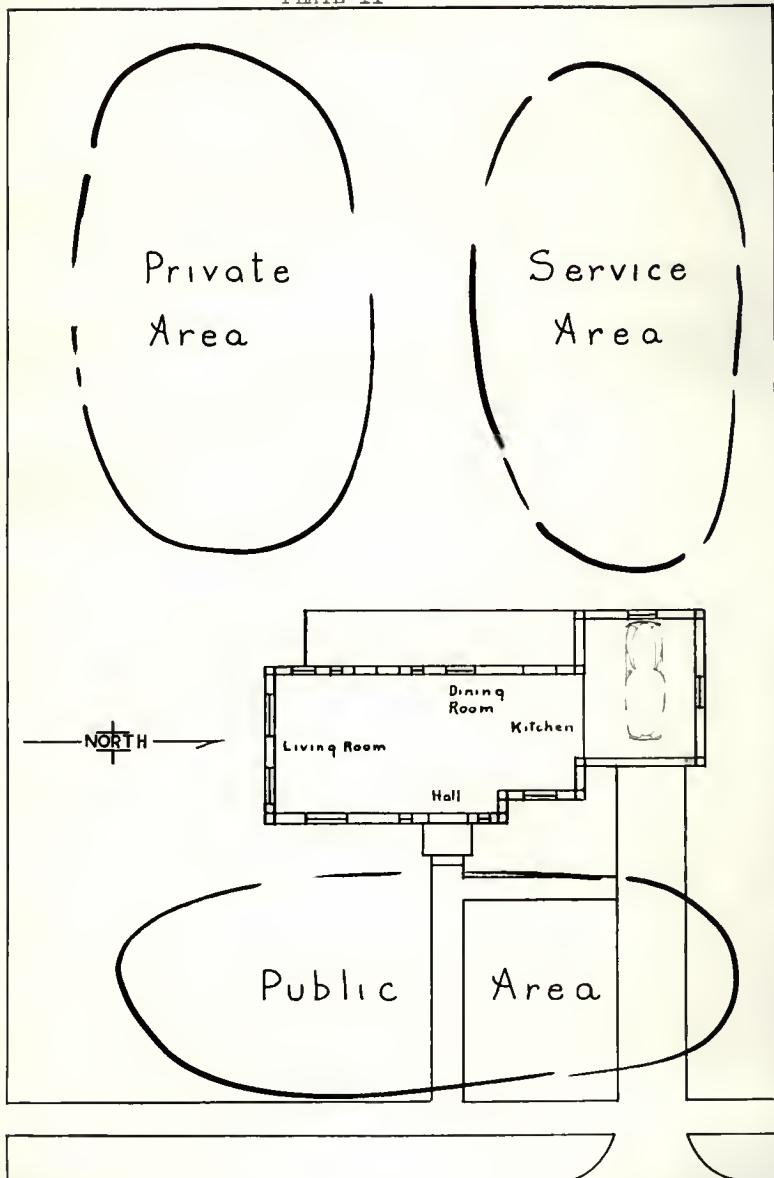
A step closely related to the orientation of the house is its actual location on the grounds. In general, consideration should be given first to the topography of the grounds when actually placing the house on the plot. There is a certain relationship between the style of the house and its setting, as well as its general landscape treatment. For example, "modern" houses require open lawns and simple plantings. Houses of Spanish and Italian design trace their need of a hillside site to the rocky shores of the Mediterranean Sea.

There is also a need for certain types of landscape treatment to fit the type of house. Colonial houses need spacious grounds and semicircular drives. Italian houses require a stiff, formal design. However, the style of the average middle-western home is not so bound up in convention, and its requirements, in general, are relatively simple.

The house should be placed on a slight elevation to provide air and water drainage. Grading necessary to accomplish this will be discussed under that heading. If the grounds are large and include a hill, this does not mean that the house

EXPLANATION OF PLATE II

Orientation of the house and the division of the grounds into use areas.



should be perched on the top. Rather, it should be on the southern slope, where in the winter it will be protected from the snow and north winds and receive an abundance of sunshine, and in the summer it will catch the southern breezes.

Included in this consideration of the location of the house, topography, and landscape treatment is the division of the grounds into use areas, which must be considered before the site is staked out. These use areas are three in number, the first of which is the public area. It is that portion of the grounds between the house and the street or road, which serves to introduce the house to the public and provide a setting for it. The second general area is the service area. Here are grouped the service entrance of the home, the garage, the drying yard, play area, vegetable garden, and any other utilitarian features. The third important area is the private area, that portion of the grounds adjacent to the living room, which serves as its continuation in the out-of-doors. Here the members of the family can share with their guests the joys of a beautiful landscape.

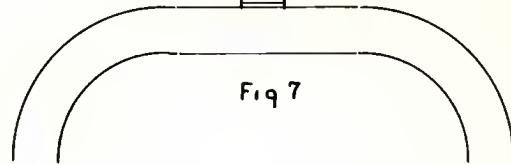
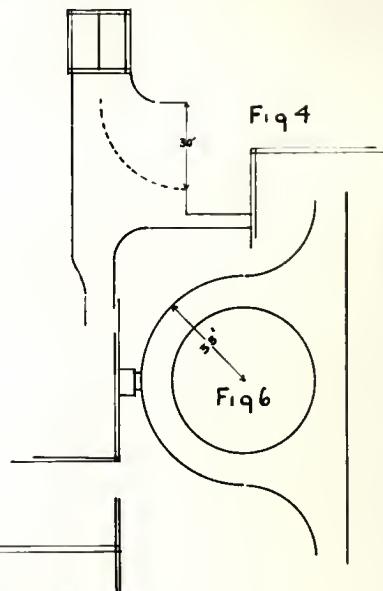
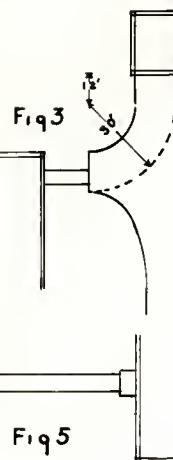
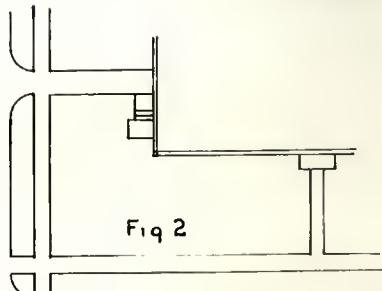
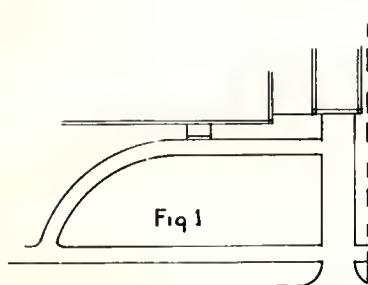
Included with the location of the house are the problems of the garage, driveway, and walks. It is becoming more and more acceptable to have the garage very near to the house, or attached to it. The practicability of this is apparent with each summer rainstorm or winter snow. This union of house and garage is most convenient and need not be unattractive. Such an arrangement also helps to make the drive short and direct.

The driveway servicing the garage should enter the property

at a convenient place and proceed as directly as possible to the garage. At the entrance, it should meet the street or road at right angles unless the predominate flow of traffic goes and comes from one direction. In this case it may be permissible to favor that direction but not to the extent that it is difficult to go in the other direction as well. The entrance should be sufficiently wide to allow for ease in entering. On a small property it is desirable to have a straight drive proceeding directly to the garage. If the drive is short, as it is when the garage is attached to the house, it is convenient to back the car out (Plate III, Figs. 1 & 2). Corner lots provide for short, handy drives from the secondary street (Fig. 2). If the drive is longer than a hundred feet, a turncourt should be provided. This is usually immediately adjacent to the garage and the all-weather surface may double as a game court of some type. If space is limited, a spur for backing and turning may be used (Fig. 3). This may be modified into a court (Fig. 4) if more room is available. On larger grounds a circle drive (Fig. 6) may be installed on one side of the house. Southern colonial homes often have a sweeping, curved drive (Fig. 7), which is lowered just a little so it is not noticeable from the street level. Driveways should always provide some contact with the house, either directly (Figs. 6 & 7), or by means of a secondary walk (Figs. 1, 2, 3, 4, & 5). In some cases the drive may do double duty and serve as a walk (Figs. 1 & 2) leaving more open space for the front lawn. A pass court (Fig. 5) is often desirable because it allows space to park

EXPLANATION OF PLATE III

- Fig. 1. A direct driveway serving also as a walk in conjunction with a curved walk, leaving the center of the front lawn open.
- Fig. 2. A direct walk and drive on a corner lot.
- Fig. 3. A "Y" drive for a one-car garage.
- Fig. 4. A "Y" drive for a two-car garage.
- Fig. 5. A pass court.
- Fig. 6. A circular turncourt.
- Fig. 7. A circular drive.



a car without interfering with the use of the drive.

In most cases the front walk should proceed directly to the public sidewalk in a straight line (Fig. 2). Curved walks are often meaningless unless dictated by special conditions of topography or existing trees. Entrance walks should be about four feet wide for double traffic and of a material that is durable. It is generally best to subdue the front walk so that it is not so obviously cutting the front lawn area in two. Plantings of hedges or flowers bordering it should be avoided except in special cases.

In Plate II can be seen the result of these considerations of location as applied to the demonstration grounds seen in Plate I.

The house has been placed toward the front and closer to one side of the lot than the other. This location is about forty-five feet from the street and provides sufficient public area for a house of this size in relation to the size of the grounds. Consideration of the topography indicated that this would be a good site, since it is on top of the first terrace where a minimum of grading will provide the house with a good setting and proper drainage.

This location is also in accord with the approved relationship of the use areas to the appropriate rooms of the house. The front entrance joins the public area; the living room, the private area; the kitchen and garage, the service area. The driveway is near one side to keep it as unobtrusive as possible. Both it and the front walk proceed directly to the street.

Another consideration in the location is the benefit to be derived from the existing elm trees whose shade will be most welcome in that area. The catalpas, which are not particularly desirable trees, were occupying the best building site and had to be removed.

The public area is automatically determined when the house is located, as it is the portion of the grounds between the house and the street or road, commonly called the "front yard". It should be only large enough to introduce the house and provide a setting for it, leaving more ground for the other areas--especially the private areas.

The landscape treatment of the foreground of the home should center interest in the house itself. This is best accomplished by use of an open lawn of good, green grass, some well-chosen shrubs properly grouped in the foundation planting and borders, and over-all enframement by selected trees. The first consideration is to have the landscape design in keeping with the architecture of the house. The general methods discussed will suit most Kansas homes. ("Modern" homes are an exception and will be mentioned later.) Beginning with a sketch of the facade, or front, of the house, plant forms are selected and arranged to achieve a pleasing design. Trees are used behind the house for background, and flanking the front for enframement and shade. One large, high-trunked tree on each side of the front lawn often suffices to enframe the house and soften the lines of the building. Border plantings of groups of shrubs along the sides of the front yard help enframe the house as well as

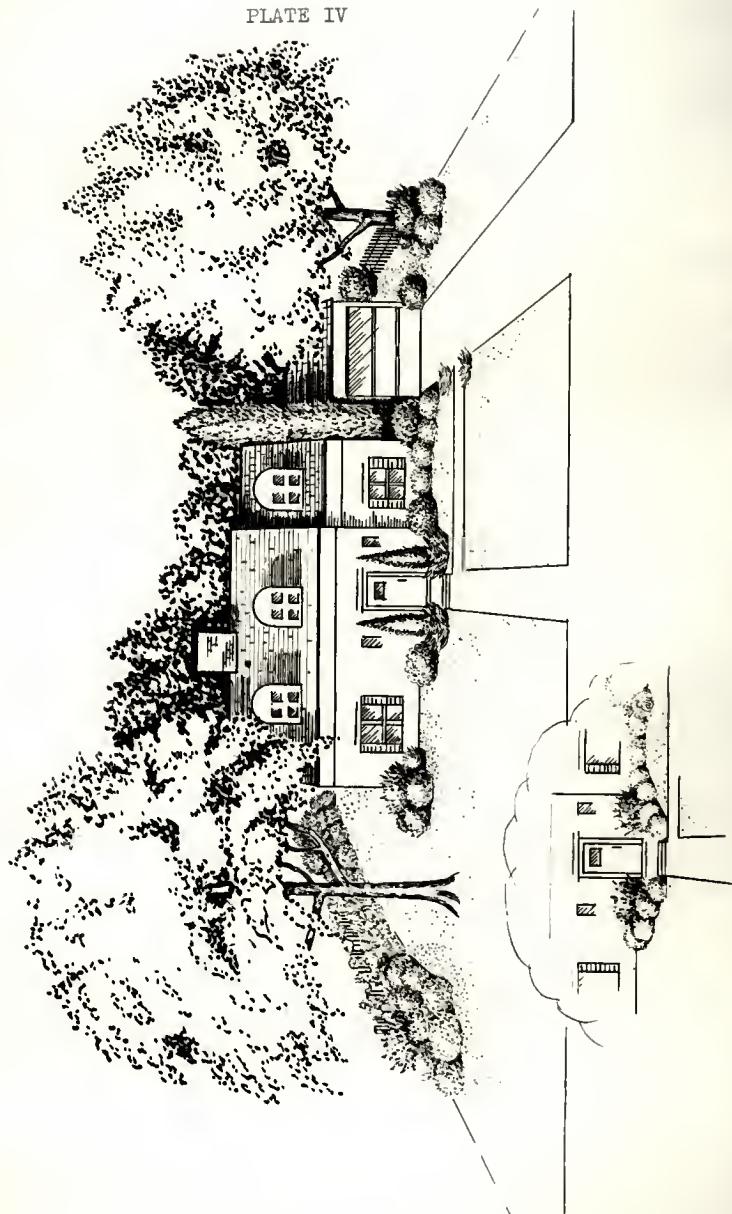
define the public area. The house and the grounds are united into an attractive picture through the use of foundation plantings, which provide an interesting transition from the one to the other. Accent in the foundation planting is found about the doorway, which is that portion of the house of most interest to the public. Other groups of shrubs at the corners and about the foundation complete the setting. (Such terms as foundation planting and enframement will be discussed later in more detail.)

The treatment of the public area of the model grounds can be seen in perspective (Plate IV) and in plan (Plate V). The house is a type of modified Cape Cod design. The two trees on either side, aided by the shrub groups along the fence, enframe the house; the shrub plantings around the foundation "tie it down" to the grounds; and the doorway is emphasized by upright evergreens. The foreground is a broad, open expanse of green lawn, and the driveway is far to one side so as to be as inconspicuous as possible. To complete the planting design of the problem area, small groups of shrubs have been so placed along the boundary fence as to generally outline the semi-circular area of the front yard which is given over to the setting of the house. Notice that the front walk proceeds directly from the doorway to the sidewalk and that, likewise, the driveway connects directly from the garage to the street with a lateral walk from the driveway servicing the front door.

Grouping of Utilitarian Facilities and Designation of the Service Area. The service area, that portion of the grounds devoted to the utilitarian activities and facilities, is deter-

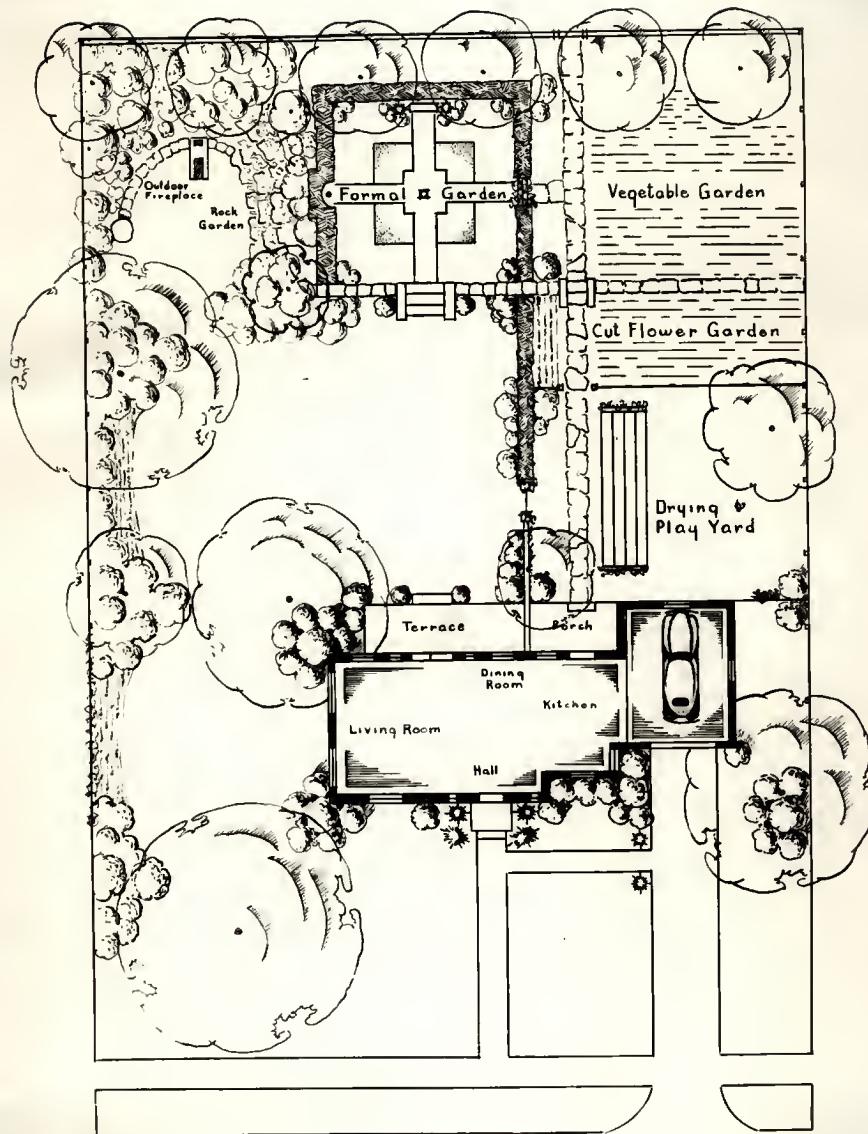
EXPLANATION OF PLATE IV

A perspective view of the front of the model house showing the landscape treatment and an alternate design for the entrance.



EXPLANATION OF PLATE V

A landscape plan of the entire model home grounds illustrating one approved method of treatment; combining proper landscape principles with the wishes of the family on the given area.



mined mostly by the location of the garage and service entrance, or entrances, to the house. For the sake of convenience and to save the busy housewife precious steps, the drying yard, play area, and vegetable garden are grouped together in the vicinity of the kitchen or service door. This entire area should be set aside and screened away from the street as well as from the private living area of the grounds. This may be done by walls, fences, hedges, and informal plantings. A surfaced walk of some type is essential in the service area. This is necessary for the use of the housewife so that she may go from the kitchen to the drying yard and the vegetable garden and the disposal facilities in inclement weather. The play area for the small children should be fenced in and quite close to the kitchen so that the mother of the household can watch over the children. Provide plenty of grass and adequate shade for the area and make the plantings very simple. The drying yard should be close to the kitchen and easily accessible from the walk. Permanent posts and wires may be installed or removable revolving dryers can be used where space is needed. Permanent installations may be made more attractive by the addition of trellises and vines or roses. The vegetable garden in the area should be only as large or as small as the needs and desires of the family dictate. Properly planned and cared for, a small area can raise a great many vegetables. Many households like to include berries or even a fruit tree or two.

In the model plan (Plate V) the service area has been screened from the street by the garage and a small picket fence.

In addition to this, plantings in the front yard make doubly sure that the area is cut off from the public view. The service area is screened from the private area by a combination of a rock wall and a clipped hedge. Access to the kitchen from the driveway may be had through, or around, the garage. A back porch is provided at the kitchen door and a flagstone walk services the entire area. This particular service area includes a drying yard placed perpendicular to the prevailing southerly winds to insure the clothes against wrapping around the line. It has been camouflaged with climbing vines. The play area is bounded by a picket fence and contains a medium-sized tree for shade. The vegetable garden is placed at the rear of the lot. It is of sufficient size to provide a reasonable portion of the family needs. In addition, an area has been set aside in which to grow cut flowers for the household. One of the two rows of cherry trees which existed on the original grounds has been retained at the rear of the lot for the family use.

Planning of the Private Area and its Relation to the House.

Last, but not least, of the three general areas of the home grounds is the private area, which is set aside for the leisure time, enjoyment, and activities of the members of the household. This has often been referred to as the outdoor living room; the reason being that it furnishes on the outside the same sort of living environment that the living room does on the inside. This relationship should be carried out further by so arranging the rooms of the house and the position of the house on the grounds that the living room is adjacent to the outdoor living

room. This arrangement provides the family easy access from one to the other, and in a good landscape design contributes to a pleasing correlation between the two.

Most discussions of the treatment of the private areas include some reference to the question of its being formal or informal. As has been mentioned before, certain architectural styles of houses, through convention, demand one or the other of these types of treatment. Italian villas must have gardens of formal design; whereas, an English country cottage is surrounded by informal plantings. A small private area may be best treated in a formal manner because in this way more efficient use can be made of the ground available. Medium-sized and large plots may be handled in either way, or by using a combination of the two. In a strictly formal design everything is laid out in a pattern of straight lines or circles and is evenly balanced and symmetrical. Plant materials used are often vigorously sheared to conform to the lines of the design. In the informal treatment there are easy, flowing lines and naturally growing plant materials. Balance may be achieved by asymmetrical means. In some cases this planting may approach the naturalistic. Most Middle Westerners of average means seem to prefer a combination of these two extremes with perhaps a leaning toward the informal design.

It is quite possible with proper planting, to provide for strictly formal areas within a landscape design that otherwise would be called informal. This has been found particularly true in the design of rose gardens. If used, such formal

arrangements should be so planned as to be on axis with some feature of the house, such as a large living room window, a set of French doors, or a terrace. It is necessary that considerable care be given to the general plan of the yard when combining these two treatments to be sure that the transition area between formal and informal is so blended that there will be no harsh clash between the two.

The boundary walls of the outdoor living room are composed of border plantings of shrubs, hedges, fences, or walls designed to contain the area, shut out the public, and provide adequate privacy. In addition, these plantings should screen out objectionable views and provide variety in shape, color, and texture, as well as flowers. Trees for shade and background should also be included.

In the model design (Plate V) a generally informal theme has been carried out. However, a formal garden has been included in such a manner as to fit into this over-all design without being obtrusive. It has been placed at the rear of the lot on top of the old terrace which has given way to an interesting stone wall. Such changes in elevation within a yard are most worthwhile and when properly handled are very pleasing (Plate VI, Fig. 1). This view of the formal garden is as it will be seen when standing in the doorway of the living room. An axial line extends from the center of this door across the terrace and terrace steps to the garden steps and centers on the sundial; which, with the garden seat behind it, serves as its terminus. The lines of the garden; that is to say, its

EXPLANATION OF PLATE VI

Fig. 1. A perspective view of the formal garden
as seen from the model house.

Fig. 2. The rock garden on the model grounds,
looking north.

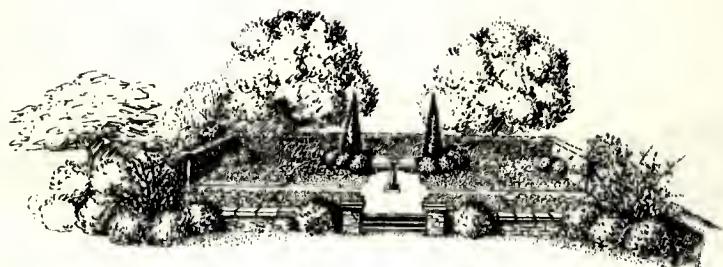


Fig 1



Fig 2

boundaries and walks, are straight and formal as are those of the enclosing hedges when seen from within. The flower beds can be planted to roses, annuals, or perennials. This is a good location for roses, being open and sunny most of the day. The simple, symmetrical planting at the steps and flanking the garden bench serve to further center ones eyes upon the sundial. This garden terrace, viewed from the living room door fills all of the requirements of a formal garden. The plantings about it, when viewed from other angles, hide its stiff, formal lines and in no way does it clash with the simple informality of the rest of the design.

The remainder of the private area of the grounds is treated simply and informally. The picket fence and the shrub border to the south effectively screen that side of the yard. Beginning at the front of the yard, the first group of shrubs in the border serves in part to separate the private from the public area in that portion of the front yard. The group is centered about one large shrub which is faced down by medium-sized shrubs planted about it and they in turn are faced down by small shrubs (Plate IV). Such grouping provides a pleasing combination of foliage masses as well as flowers during the blooming season. Between it and the next group of shrubs is a perennial flower border which has the picket fence for a background. The second group of shrubs, together with the group at the northwest corner of the house and the trees growing over them, serves to cut out what views might be had through the plantings in the front yard into the private area. The

next bay is also devoted to perennials, including shade-loving plants, as they will be growing under the trees indicated. This tree is one of the two elms that were existing on the original plot of ground. It is in a fine position to shade a considerable portion of the private area during the hottest part of the day. The shrub planting beneath this tree and that around the southwest corner of the formal garden make the area south of the formal garden a very secluded nook. Shrubs selected are capable of competing with the elm tree. Here is located a rustic outdoor fireplace (Plate VII) which will provide the family many happy hours of backyard picnicking. Notice how its lines blend into those of the rock garden. The old terrace has been altered here somewhat to make way for a naturalistic rock garden which has been built into this sunny slope south of the formal garden (Plate VI, Fig. 2). Informal groups of shrubs, together with the hedge, effectively screen and blot out the latter from view. A very effective naturalistic rock garden has been worked out on the slope. The rocks are placed in horizontal lines just as they appear in nature, and ledges are suitably planted with small alpine plants. Such a garden is an interesting and proper place in which to grow many of the small flowering plants that would be lost in the border, and that prefer the well-drained soil between the rocks.

The major portion of the private area has been left in open lawn, adjacent to the flagstone terrace, where it is easily accessible from the living room of the house. This allows the family to use it in many ways. A number of guests could be

EXPLANATION OF PLATE VII

The outdoor fireplace in a setting of native plant material on the demonstration grounds.



entertained there, and games of many kinds could be played. Comfortable garden furniture in the shade would provide an excellent place in which to relax on a warm summer evening amid pleasant surroundings of green lawn, flowers, shrubs, and trees.

Grading and Drainage

One of the first things to do after cleaning up the grounds and making the landscape plan is to prepare the surface of the soil by grading to fit the requirements of that plan. Over most of the state of Kansas, a minimum of grading is usually all that is required. Where it is necessary, however, certain things should be kept in mind; such as, proper drainage, a pleasing ground surface, saving topsoil, disposing of subsoils, and the effect of changes in elevation upon existing plant growth.

Grading should provide drainage away from the house so that all water will be carried away from the foundation. Little slope is required to do this and little should be used so that a maximum of the precious water will soak into the soil for a summertime reserve. In order to accomplish this, a minimum fall of one inch in two feet will carry the water away so that it does not drain into the basement, yet gradually enough so that some of it will soak in. This slope means that for every two feet of horizontal ground distance the surface will drop one inch. For example, the difference in elevation on a fifty foot lawn area would be twenty-five inches from the high side to the low side. In some cases where terraces or retaining

walls are used, it may be necessary to provide underground tile drainage in areas where water will naturally collect and not be able to drain off otherwise. Various methods of providing proper drainage away from the house as well as providing a good setting for the house may be seen in Plate VIII. Changes in elevation within the grounds can often be made very attractive by the use of terraces, rock retaining walls, and steps which lead from one level to another.

Another problem is to provide a pleasing ground surface for the area. A large portion of every home grounds is devoted to lawn, and rightly so. Therefore, much of the grading problem has to do with the correct preparation of lawn surfaces for seeding or sodding, keeping in mind the ultimate appearance when the operation is complete. Many lawns, unless very small, benefit by having some variation from a plain flat surface. The rolling undulations of natural ground forms as seen on the Kansas prairies are just as interesting when reproduced in the lawn surface.

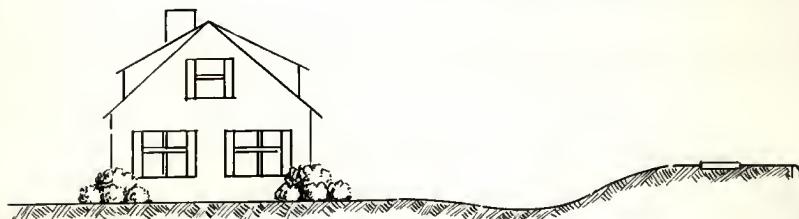
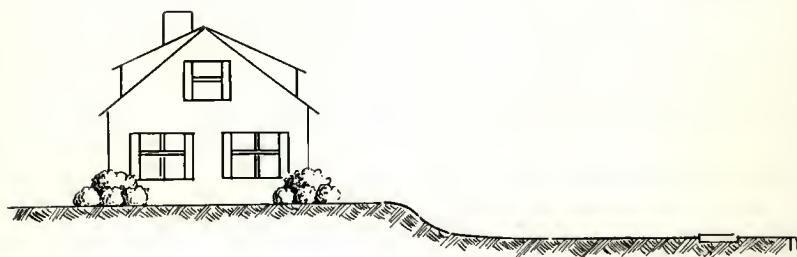
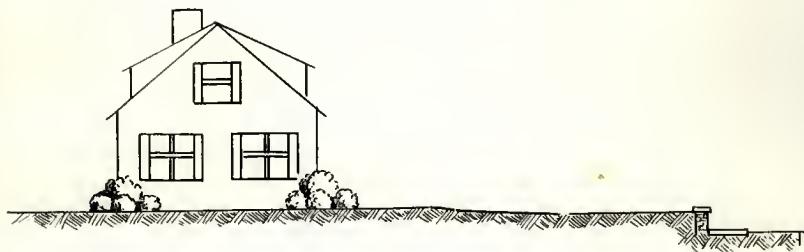
Any grading operation in which it is necessary to remove soil in one place and fill in soil in another should be done so as to first excavate and place on one side the surface layer of good topsoil. Then, the bulk of the cut and fill operation can be accomplished with the subsoil until a point is reached at which the return of the topsoil will bring the area to the desired grade. This topsoil may benefit by the addition of some well-rotted manure and commercial fertilizer. Larger amounts should be used where trees and shrubs will be planted. Although

EXPLANATION OF PLATE VIII

Four methods of grading the front yard under varying conditions--a gentle concave slope, a rock retaining wall or an abrupt grass terrace where there is considerable change in elevation, and a method of drainage away from the house where it is lower than the street.

PLATE VIII

42



the excavation for the foundation and basement of the house is properly the job of the contractor erecting the house, it should be specified in the contract that he, too, will save the top-soil and dispose of the subsoil entirely or place it in a fill where it can be covered with topsoil. He should also remove all rock, sand, pieces of lumber, etc., from the premises and not just cover them up as such material is detrimental to growing plants.

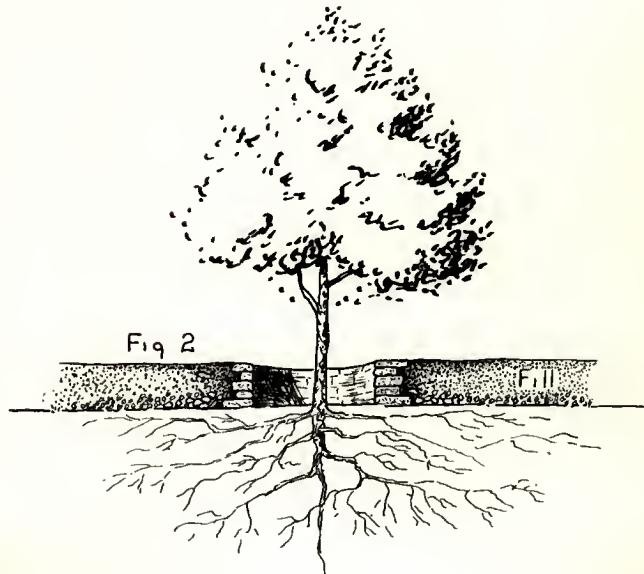
Trees of any size which are to be saved and are in an area whose surface is to be raised or lowered will require special consideration. Trees in an area, the surface of which is to be lowered, cannot be saved unless a good portion of the soil within the radius of the roots is maintained at or near the existing level (Plate IX, Fig. 1). This can sometimes be done by the use of retaining walls. Often in nature, trees are found with a slight hillock of soil under them which was retained by the root system while the surrounding soil eroded away. On the other hand, trees growing in an area to be filled can be saved by the erection of a "dry well" about the trunk and by the application of crushed rock before the fill is made over the area covered by the branches (Plate IX, Fig. 2). This provides necessary aeration for the root system.

The model grounds appear as they were originally, in plan (Plate I), and in profile (Plate X, Fig. 1). The east row of cherry trees has been removed as has the group of catalpas. After the contractor has finished the buildings, drives, walks, and walls, it will be necessary to bring the ground to proper

EXPLANATION OF PLATE IX

Fig. 1. A tree located where the grading plan calls for removal of some soil may be saved if the cut is kept to a minimum in the vicinity of the area covered by the tree.

Fig. 2. A tree in an area to be filled may be saved by the erection of a dry well of stone about the trunk and the application of rock or gravel over the area covered by the tree.



grade in conformity with the desired plan. Such grading will have to be done as indicated in Plate X, Fig. 2, which is a profile through the center of the formal garden and is located on the grading plan (Plate XI) as line AB. A study of the profile and the plan indicates some soil will be removed (cut) from the upper terrace to level the formal garden and that rock retaining walls will be built to maintain this level. Another cut is made to provide more room for the rock garden and outdoor fireplace. The middle terrace will be cut to provide drainage away from the house and to the sides. The soil from these cuts will be used to fill out the southeast corner of the terrace and the front yard and provide a slightly concave, sloping lawn from house to front walk. Enough variation in this front lawn area is provided to avoid monotony and make it interesting. The tree at the corner of the house will not be harmed by the removal of the small amount of soil in its vicinity, nor will the one along the south fence be affected by the slight change there. Rocks of the rock garden can be used to retain sufficient soil around the one cherry tree on the south end of the row.

After this grading has been properly done and the topsoil replaced and worked down, the foundation has been laid for the actual planting process.

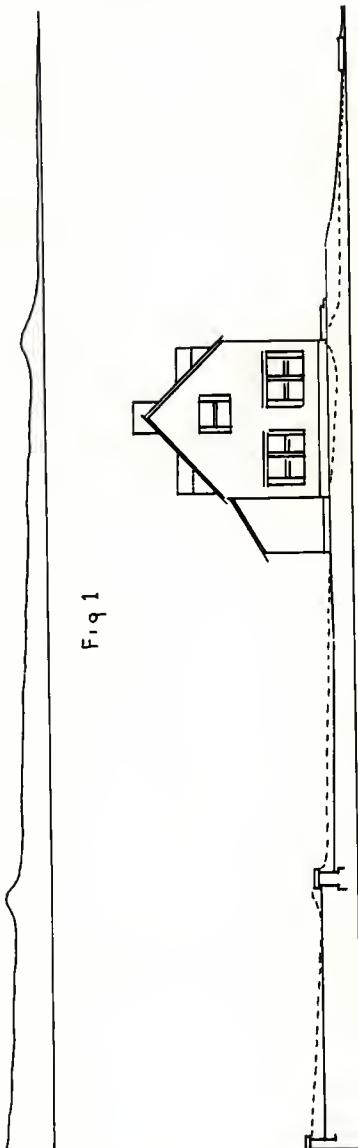
Plantings

The placing of trees, shrubs, and flowers about a home by a landscape architect fills many specific needs in order to

EXPLANATION OF PLATE X

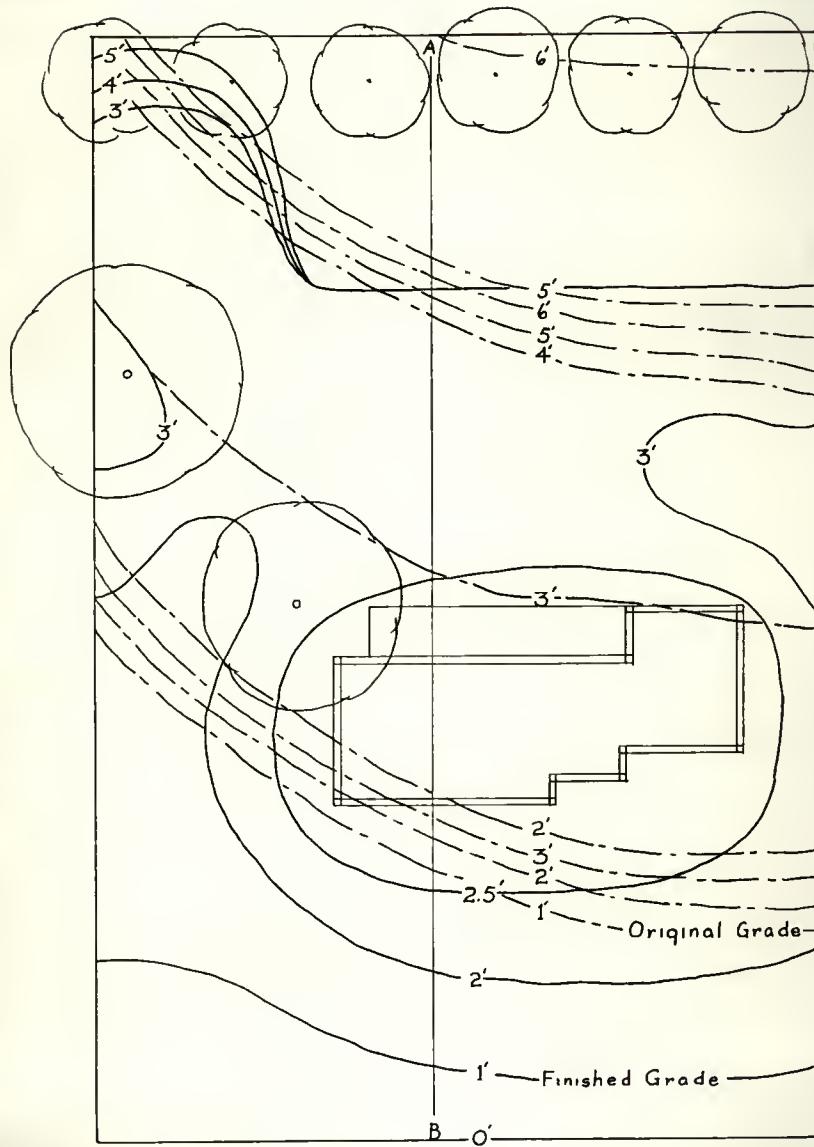
Fig. 1. A profile of the model home grounds prior to building and grading, showing the slope of the ground on the two terraces.

Fig. 2. A profile after building and grading, taken on the line AB of the grading plan in Plate II. The old profile is superimposed with a dotted line so that the changes brought about by the grading may be more readily noted.



EXPLANATION OF PLATE XI

The grading plan for the model grounds.



achieve the pleasing results obtained. An enumeration of some of these will reveal many of the considerations that go into the placing of the various plant materials in their proper locations.

Trees. Trees are among the most important, as well as the largest, of the plant forms used. A great deal of thought should go into the selection of just the right trees to accomplish the best results under the given conditions of climate, soil, moisture, use, and need. Most trees require years to reach maturity and cannot be so easily and economically replaced as shrubs, if, for any reason, they are found undesirable. Ultimate height and spread also must be considered when making a selection. Kansans, perhaps more than many other Americans, can appreciate the full value of a tree, not only for its shade and cool, green color but for its aid in combating the drying summer winds and its effect on the eroding top-soil. Many trees can be placed so that they will serve a double or triple role. Certain of the smaller trees, such as the Eastern Redbud, have very attractive flowers. There are trees of many shapes and habits of growth. A contrast to the broad-topped American Elm is the conical Pin Oak. Textures vary from the fine foliage of the Common Honeylocust to the coarse leaves of the Sycamore. Many colors are to be found ranging from the silvery white of the Russianolive to the reddish purple of the Purpleleaf Plum, the light green of the Western Scaberry, and the dark green of the Norway Maple. (See Tables 1 & 2 of the Plant Material Lists for recommended trees

and their characteristics as well as uses.)

The universal function of a tree is to provide shade, which is an important consideration in the Middle West. The two trees in the public area (Plate V), especially the south one, furnish shade for the front lawn and the front of the house. Of the two original elms that were saved, the one nearer the house shades the southwest corner and the terrace, and the other provides shade for the lawn area in the rear. The small tree in the play yard supplies shade for the children while the one near the kitchen porch shades that area from the hot afternoon sun.

Enframement is one of the uses to which trees are put. They are so planted as to enframe a view into a garden or to enframe the house itself. In the model plan, the two large trees in the public area serve in the latter capacity (Plate IV). Here it is desired that a view may be had under them, and high-trunked trees such as American Elms are desirable in such locations.

Trees are used to soften or break up harsh architectural lines of buildings. The two trees that frame the house (Plate IV) do this by blocking out the extreme roof corners. The upright tree to the left of the garage door breaks up the monotony of the stairstep roof line.

Background for the house is supplied by all of the trees to the rear of the house whose tops show above the roof line.

Unsightly objects can be screened out of view by trees which are properly placed. Referring again to Plate V, the line of cherry trees at the rear of the grounds screens any

undesirable view of the slley or neighboring grounds and also provides a background for the rear yard.

Street trees in the larger cities are often provided by the city park department and streets look best when uniformly planted to one species. Many rural roads are attractively planted with a bordering row of trees on either side.

Shrubs. There are, fortunately, many sizes and types of shrubs to provide variety in the plantings about the home. They range from fifteen-foot, tree-like shrubs such as the Common Smoketree and Staghorn Sumac to small, dainty plants like the Anthony Waterer Spirea. Many of the smaller evergreen trees are also considered in this group by the landscape designer. A wide variety of shapes, colors, and flowers are available. Shrubs are most important in plantings about the house and the boundaries of the grounds. (Recommended shrubs will be found in Tables 1, 2, & 5 of the Plant Material Tables.)

In the foundation planting, shrubs are used to provide a pleasant transition from house to grounds and properly relate the one to the other. Shrubs which have been appropriately selected and placed will add to the attractiveness of the home. Elevation studies are made (Plate IV) before the planting plan (Plate V) is drawn. Preliminary sketches are first prepared to determine the best combinations of forms that will produce the results desired. Later, in the plan, these forms are transposed into specific plants. In general, shrub forms are placed in groups or singly at the corners of the house and in any recesses along the foundation. Some variation in shape, texture, or

color should be used to avoid the monotony of a fringe of Van Houtte Spires all around the house, for example. On the other hand, this variation should not be overdone to the point where all unity is destroyed.

An all evergreen planting is just as effective in the winter as in the summer and has its merit but is rather monotonous. Best results are obtained by a judicious combination of evergreen and deciduous plants. Evergreens fit into the foundation plantings perhaps better than in any other type of planting on the home grounds. Most of them, if properly grown, will carry their foliage to the ground, but usually look best if faced down with low spreading evergreens or deciduous shrubs. The upright evergreens about the door in Plate IV have been handled in this manner.

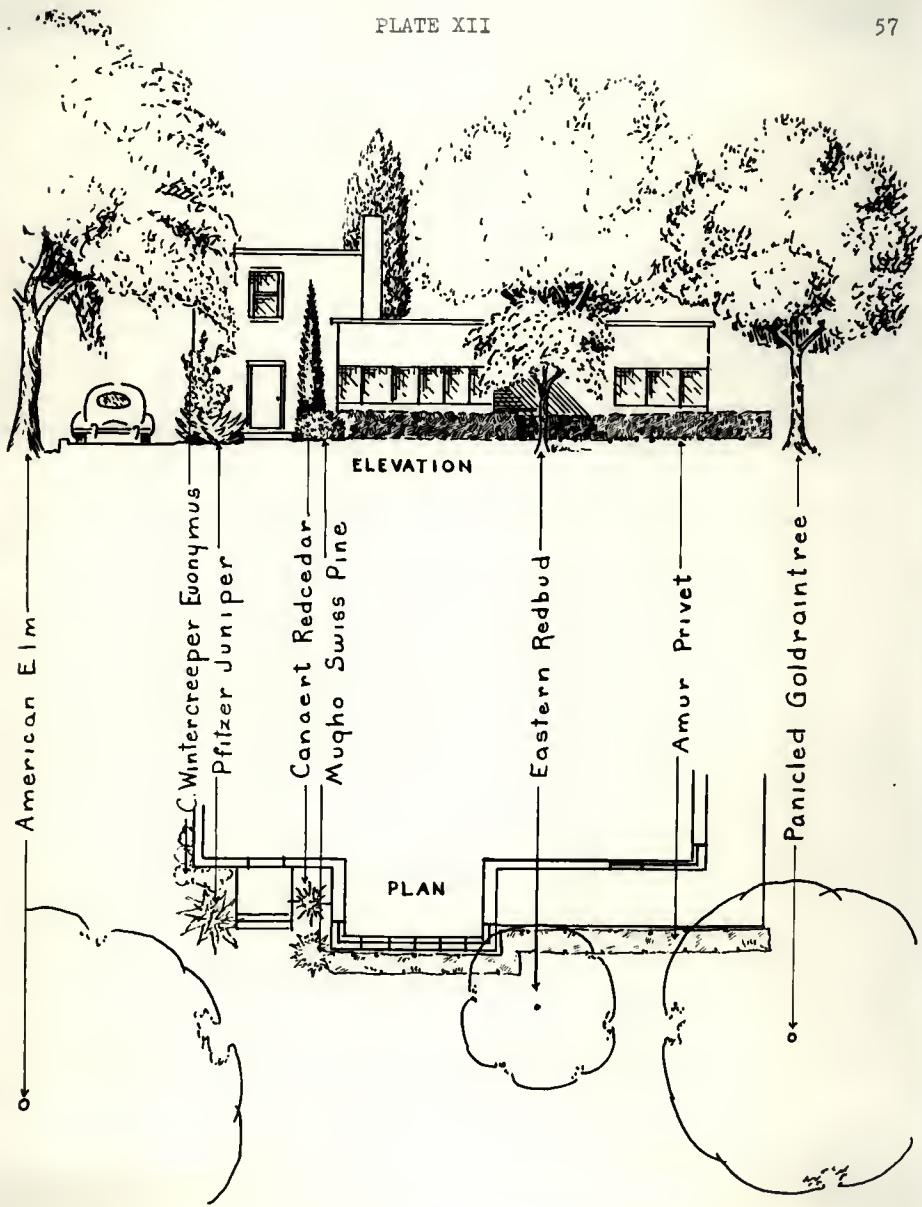
One of the points of emphasis in a foundation planting is the front doorway. Special care is taken in selecting the plant forms which will best draw the proper amount of attention to the doorway. This can be accomplished in many ways but variation of form is probably the most striking. In Plate IV the only conical, upright forms used in the front foundation planting are those two which flank the doorway. The contrast provided between them and the other forms immediately draws attention to the door. In addition, as they are coniferous evergreens, they provide variation in color and texture, which further emphasizes this portion of the planting. The alternate illustration indicates another method of planting which achieves the same result through color and texture values.

Different types of architecture call for different methods of design in the foundation planting. One particular method is the combination of avargreens and deciduous shrubs (Plate IV). A "modern" house with its long, horizontal lines and low roof requires a design of a very special type (Plate XII). The architect who designed this house brought together a pleasing combination of masses, some of which require emphasis, and some, toning down. To treat such a house in the conventional manner would be an error. Series of round shrub forms along the foundation would be incompatible with the long, horizontal lines of the right wing. The clipped hedge, whose lines parallel those of the house, is quite appropriate. To avoid monotony, the small Eastern Redbud is placed in front and breaks the horizontal lines somewhat. Attention is focused on the doorway by the tall, columnar Canaert Redcedar, supported by the Pfitzer Juniper and the Mugho Swiss Pine. Such asymmetrical balance is very well suited to this composition. Hard lines are broken, not only by the Redbud, but by the framing and background trees and the evergreen vine on the corner near the driveway. This provides a different foundation planting effect, yet one which is appropriate to a house that is different.

Plant material to be used in a foundation planting should be of a type that is in harmony with the color and architectural design of the house. It is not desirable, in most cases, to have a continuous foundation planting about the building but to allow space here and there where the wall can be seen making contact with the ground.

EXPLANATION OF PLATE XII

A "modern" home with the landscape treatment
designed to be in harmony with the architecture.



A common fault in foundation plantings is the purchase of "cute" little trees and shrubs which are planted close to the building with no consideration of their future height and spread. When such plants mature, they are forced away from the foundation in the struggle for light, and become very unsightly. Most plants should be at least three feet from the foundation and properly spaced to allow them sufficient room to reach the stage of maturity desired, where they should be controlled by proper pruning. It is even better to select plants whose ultimate size will require no pruning. All too often pruning is neglected; with the result, that in a few years the foundation planting has become an impenetrable screen covering the front and sides of the house--including the windows. Proper attention to this matter is essential. It is well worth the little thought required in the planning stage.

The solution of the foundation planting problem as applied to the model house can be seen in Plates IV & V. The house is a modified Cape Cod design with garage attached. Living room, dining room, kitchen, and hall are on the first floor and the bedrooms are on the second floor. The main portion of the front of the house contains the front entrance which is without roof covering and has a small stoop. In addition, the doorway is flanked by two tiny windows with a large living room window to the left. The face of the building recedes several feet in a step fashion from the front entrance to the garage. The monotony of the roof is relieved by dormer windows and a large, substantial chimney. The repetition of the step

outline of the roof has been broken by planting a tall, columnar tree at the junction of garage and house. The front door is accented by the use of a sheared pyramidal evergreen on either side of the doorway, in one treatment. These taller trees are faced down with low, spreading evergreens; and the remainder of this planting, for variety's sake, is composed of deciduous shrubs, which furnish contrast in color, form, and texture. The alternate treatment makes use of deciduous shrubs, varying in color and texture only. Medium-sized, deciduous plants are grouped at the corners and faced down with smaller ones. A portion of the foundation is allowed to show through under the living room window. This absence of plant material allows for free air movement through the window. The over-all effect of the entire planting gives one an impression of open, green lawn, and a house nicely enframed, whose lines have been softened and whose doorway has been so planned as to draw the proper amount of attention.

The term shrub border is one that is applied to almost any grouping of shrubs. Border plantings, however, are usually thought of as those plantings about the boundaries of a given area. Such borders may delineate the outline of the home grounds and be used in subdividing those grounds into the major use areas. These groups of plants are usually of two and often of three sizes. The large shrubs usually can be described as leggy; that is, their foliage does not cover the stems. Such large shrubs should have smaller, medium shrubs planted in front of them to hide these bare stems; while they, in turn, may have

small shrubs, called facers, planted in front of them. This results in a pleasing outline for the border planting (Plate XIII).

Certain of the medium-sized shrubs, if properly grown, need no facer. These include Mentor Barberry; Common Flowering-quince; Weeping Forsythia; Morrow and Winter Honeysuckle; Vanhoutte Spirea; and certain of the lilacs. Small deciduous facer plants are few in number. Japanese Barberry; Japanese Floweringquince; Slender Deutzia; Golden St. Johnswort; Anthony Waterer, Froebel, and Thunberg Spires; the Common Snowberry; and both Chensult and Indiancurrant Coralberry are the ones most commonly used for this purpose in the shrub border.

Borders should be so arranged that, as seen from above, their boundaries will be pleasant, flowing lines including bays and promontories (Plate V). Quite often these borders will have a property line fence in the background. In many cases, it is well to provide space in the front of the shrub border, especially in the bays, for the planting of perennial flowers.

Where space is limited or a formal effect is desired, hedges may take the place of shrub borders. Various spiresas--Vanhoutte, Thunberg, Froebel, and Anthony Waterer--may be used for an unclipped flowering hedge. Such a hedge should be used only where there is plenty of room and light for the proper development of plants so that they do not become leggy. The plant material used may be left unpruned--often with very pleasing effects. On the small city lot a well grown hedge two and one-half feet wide may serve the same purpose as an eight foot

EXPLANATION OF PLATE XIII

Elevation and plan of a shrub border illustrating the proper care of tall, medium, and fleshy shrubs in relation to each other.



Tall Medium Facer



shrub border on larger home grounds. In any formal design, clipped hedges provide a border and a framework for the formal lines of that design. Note the use of hedges around the formal garden in Plate V. Another hedge has been used in conjunction with a rock wall to separate the private area from the service area. These two were used because they require a minimum of space.

Probably the most widely used hedge plants are the privets in their many forms. They have been used for both clipped and unclipped hedges. These hedge plants should be closely cut back when planted to induce bushy growth near the ground. As they grow they should be clipped regularly and the easiest shape is square or oblong; although a better shape is one just slightly larger at the bottom than at the top, as this provides a better growth of foliage near the ground. Hedges should never be cut in a V-shape; that is, narrower at the bottom than at the top. In Western Kansas, Chinese Elm seedlings have been planted and clipped, and formed into useful hedges. Many of the evergreens are very valuable as hedge plants. Common Redcedar and certain of the arbor vitae make a fine hedge for both winter and summer effects. (For other hedge plants, consult the Plant Material Lists at the back of this paper.)

Shrubs as well as trees are used in screening out objectionable views. Many times, the height and composition of the shrub border can be so planned as to perform this function as well as its primary one.

Roses. No discussion of home grounds is complete unless

it includes the roses. A few of the shrub roses, such as those listed in the Plant Material Tables as rose species, can and should be grown as shrubs in the shrub border or elsewhere; but the great majority of roses, especially Hybrid Tees, are rather exclusive plants and prefer to be grown in beds by themselves where all competition is eliminated. This accounts for the fact that wherever roses are grown they will usually be found in a special rose garden where they can get the proper attention that they require and deserve. This characteristic, in addition to their beautiful flowers, has made them a favorite in the formal garden. Such a garden should be placed where it can be enjoyed to the fullest and where the roses will grow best. It should be in an area which receives sunlight during the greater part of the day. The formal rose garden in Plate V fits both of these requirements. (For colors and kinds, consult the Plant Material Lists in Table 7.)

Under certain conditions, rose-beds have been made an effective part of a shrub border. When they are so included, sufficient space must be allotted to the bed so enough roses can be planted to make a good showing. The small Polyantha and the Floribunda types are sometimes used as dwarf flowering hedges or in the front of the border as a facer. The climbing roses may be used in a number of ways; on trellises or arches over the entrances to the formal gardens, on fences, or to screen unsightly objects. At times they may be used in the foundation planting of the house.

Vines. Vines are of many types; ranging from the woody

Winter Creeper Euonymus, with evergreen foliage, to the Common Annual Morning Glory. Vines serve many purposes in the landscape plan. The clinging vines are useful to break up the monotony of large expanses of building walls and to soften architectural lines. Many of them are suitable on trellises and arbors. Numerous vines can be used as ground cover in situations where grass will not grow, due to dense shade or extreme slopes; for example, Common Periwinkle and English Ivy. Most of the vines have very attractive foliage and quite a number produce lovely flowers. (See Tables 3, 6, & 10).

On the model plan (Plate V) vines are planted on trellises adjacent to the clothesline posts, over the trellis on the gate north of the garage, and on the north side of the terrace wall.

Flowers. Plantings about the home are never complete until flowers--either perennial, or annual, or both--are included. Many people, however, are thoroughly satisfied with only trees and shrubs, which, once established, require but little maintenance. It is true, attractive landscapes can be designed without the use of flowers, but they are inferior to those that have the finishing touch provided by the bright colors of flowers. Flowers are used in the rock garden, the wild garden, the front of the shrub border, and in separate perennial borders--treated either formally or informally. It is better to grow cut flowers in a separate plot than to take them from the perennial border.

Perennials are those herbaceous flowering plants which are capable of living over the winter season, and which grow and

bloom year after year with reasonable care. They play an important part in the landscape design. There are many kinds of perennials. Flowers range from dainty, blue Brunnera and white Snow-in-Summer to huge golden Maximilian Sunflowers and pink and white Rosemallow. Plants vary in size from six-inch Moss Phlox to six-foot Sunflowers. Foliage is available in many textures. The tiny leaves of Moss Phlox and Perennial Flax are of very fine texture as compared to the large, coarse leaves of Bocconia and Hollyhock. Fragrance is another asset of these versatile flowers and often gardens are planted with this in mind, to provide pleasant aromas on the evening air about the family terrace. In addition, many of the perennials provide beautiful cut flowers for decorating the home. Most of these pleasing characteristics are subordinate to color--the chief reason for including perennials in the garden. Colors, when properly chosen and combined, add a certain cheerfulness to the surroundings. Much has been written about this subject of grouping flower colors to obtain harmonious combinations. The most important, and final, consideration is to determine whether or not the result is pleasing to the eye. What pleases one may irritate another, so each should follow his own desires in the matter.

Perennials are among the first flowers to greet the spring because the overwintering bulbs, crowns, or roots have stored up nutrients from the previous growing season. The Crocuses and Grape Hyacinths are among the earliest arrivals, and introduce the masses of spring flowers that follow. During the heat

of summer many of the perennials slow down a little, but gather momentum again in the fall and bloom until the time of killing frosts. (The chrysanthemum is a good example.) With so many flowers available it is possible to work out combinations in the perennial border and elsewhere that will give a succession of blooms from March to October (Plate XIV). (See the Plant Material Lists, Tables 7 & 9.)

Perennials can be arranged in plant borders as has already been described--the high ones to the rear and faced with medium-sized plants, and these, in turn, edged with small, compact plants. In Plate XIV, the right end of the border has seventy-two inch Hollyhocks in the background, thirty-six inch Torrey Pentstemon in front of them, and six inch Rock Soapwort as an edging to the border.

Annuals, those busy plants which crowd a lifetime into a single growing season, are a little slower getting into bloom than the perennials, but, once started, the quantity and color of their flowers is something at which to marvel. Annuals are capable of a remarkable growth in one season. For example, Scarlet Tithonia will grow to a height of six feet and Castor-beans to a height of ten feet. These plants and the annual vines--Common Morning-glory and Balsamapple, for example--provide a quick screen. On the other hand, there are also tiny dwarfs, such as the eight-inch Dahlberg Daisy and the six-inch Trailing Senecalia.

Annuals may be used in much the same ways as the perennials in the various parts of the landscape design; the chief

EXPLANATION OF PLATE XIV

A perennial border in elevation and plan.



ELEVATION

A PERENNIAL BORDER

White Boltonia (White) Aug - Sept	Thinleaf Sunflower (Yellow) Jul - Aug	Hardy Aster (Blue) Jun - Oct	Hollyhock (Red) Jun - Oct
Butterfly Milkweed (Orange) Jun - Jul	Mistflower Eupatorium (Blue) Sep - Oct	Gaillardia (Yel/Red) May - Oct	German Iris (Purple) Apr - Jun
Dwarf Iris (Purple) Mar - Apr	Persian Nepeta (Blue) May - Sept	Snow-in-Summer (White) May - Jun	Vir. Liatris White Jul - Sept

Tarrey Penstemon (Scarlet) Jun - Jul	Moss Phlox (Pink) Mar - Apr	Rock Soapwort (Pink) May - Aug
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PLAN

Bloom from March to October

One Inch = Two Feet

difference being that they must be started anew each year, although some self-sow and return of their own accord. Most of them require a sunny location. They have, in general, as great a variety of flowers, textures, fragrances, and sizes as their perennial cousins (Plate XV, Fig. 1). They are especially useful as cut flowers, and in window and borsch boxes. (See the Plant Material Lists, Table 10.) The annuals play an important role in the plans of those who rent their homes because very nice effects can be achieved about such homes with annual plantings which cost but little.

Flowers are found on the model plan (Plate V) in the two perennial borders, fitted into the bays of the shrub border along the south boundary, in the rock garden, along the service walk, and in the cutting garden. The cutting garden is an area set aside in which to grow flowers--both perennial and annual, but mostly annual--for use as cut flowers in the house, and also as fillers for the flower beds when plants die.

Lawns. The lawn area of the home grounds is an important one and should receive as much thought, initial effort, and maintenance as any other major part of the landscape plan. The lawn serves as a base for the entire landscape picture, complementing the trees, shrubs, and flowers. A good lawn provides an excellent foreground and setting for the home.

The green grass of the home lawn, the park, and the rural landscape is one of the major factors contributing to man's enjoyment of these areas, not only for beauty's sake but because the grass controls erosion, thereby reducing dust; contributes

EXPLANATION OF PLATE XV

Fig. 1. An annual border.

Fig. 2. The picket fence and gate north
of the garage (See Fig. V).

Cucumberleaf Sunflower (Yellow) Jul - Sep	Aztec Marigold (Orange) Jun - Oct	Yellow Cosmos (Yellow) Jun - Oct	Common Zinnia (Red) Aug - Sep
Orange Zinnia Jun - Oct	Cornflower (Blue) Jun - Jul	Common Lantana May - Oct	R. Candytuft (White) Jun - Aug
Max. Ageratum (Blue) Jul - Oct	M. Periwinkle (Wh/Pink) Jun - Oct	Drummond Phlox (White) May - Oct	Painted Gaillardia (Yel - Red) Jun - Oct
(Yel) Jul - Oct	(Dahlberg Daisy)	Sweet Alyssum	Clove Pink Jul - Sep

AN ANNUAL BORDER

Fig 1

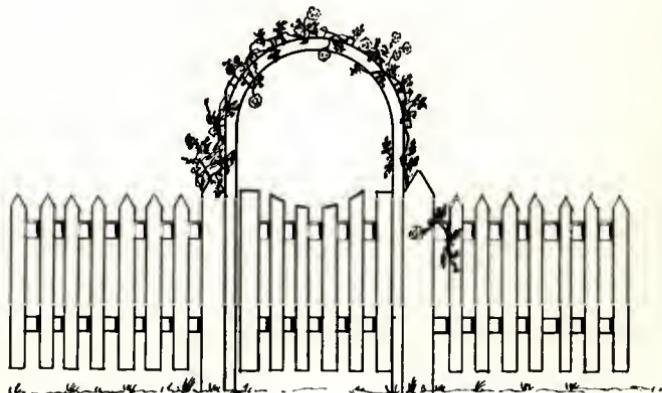


Fig 2

toward a cooler land surface; and in the rural areas, provides considerable feed for livestock.

Kansas is a natural grassland. Prior to the coming of the White Man most of the state was covered by prairie and plains grasses. Unfortunately, only a few of these wild grasses are good for lawns.

For the eastern portions of the state, Kentucky Bluegrass, Poa pratensis, is the best lawn grass. Given care and soil moisture it will grow in the less favorable areas. In contrast to Buffalo and Bermuda, it will grow in the shade and begins growth very early in the spring and continues until late in the fall with only a slight let-down during the hottest part of the summer. This slump can be avoided if intelligent care (water, fertilizer, and proper mowing practices) is given the lawn. Bluegrass is probably the most widely used lawn grass in the United States. It can be kept out of flower and shrub beds with a minimum of care, in contrast to Bermuda grass, the invader.

Another native grass which is very useful is Buffalo grass, Bulbilis dactyloides. It is more drought resistant than any of the tame lawn grasses and stands greater fluctuations of temperature. It needs to be grown in the sunlight and will not stand shading. These characteristics make it very well suited to the western half of Kansas. It spreads by runners and makes a firm, dense turf that stands close mowing and even if not mowed does not get excessively high. Its chief disadvantages are as follows: It does not start growth until late spring, its tops

are killed by the first freezing weather in the fall, and its color is not quite as dark green as Bluegrass. Nevertheless, it is a good grass.

Bermuda grass, Cynodon dactylon, is grown in the southern half of the state. Its habit of growth is similar to that of Buffalo grass. It spreads by means of runners, and makes a thick mat of grass which starts late in the spring and whose tops are killed by freezing weather in the fall. Severe winter may kill the underground parts as well, especially in Northern Kansas and occasionally in the southern part of the state. During warm weather it grows vigorously and is fairly resistant to drought and high temperatures, though it appreciates water, too. Its vigorous growth habit carries it into the flower beds and shrub plantings unless watched closely or kept out by a physical barrier deep in the soil. It has been known to grow up through asphalt paving. Another type of Bermuda is African Bermuda or Velvet grass which has much finer foliage. The grass is known in the trade by a variety of names.

Certain mixtures of grasses are often sown, especially in Eastern Kansas. Bluegrass may be combined with Redtop, Agrostis alba, and Perennial Rye, Lolium perenne. The latter two serve to establish a denser lawn, quicker than Bluegrass alone, and will die out within two or three years as the Bluegrass takes over.

Plants such as Vinca minor, recommended as a ground cover material, on slopes, in the shade, and in other places where grass will not thrive, are so designated in the Plant Material

Lists.

A glance at the model grounds (Plate V) indicates how large a part of these grounds is devoted to lawn. Most of the public and private areas are in grass, as is the combined play and drying yard. The lawn is indeed a major consideration in the landscape plan.

Garden Accessories

In addition to the living plants used in a landscape design, there are certain supplementary materials used to produce a well-developed plan. These are known as garden accessories and they fill a minor, but very necessary, role.

Enclosures. Fences were first designed to keep animals out of an area, and later, as land became more scarce, to confine animals to an area. While being used for these purposes they were found to serve other uses as well; such as, marking a division between areas, insuring privacy, and screening out objectionable views. In some cases, they fill an important role in the setting for the home. (An example is the white picket fence which is always associated with a New England Shore cottage.)

If there is need for a fence on the home grounds it should be of a type that blends into the landscape treatment and is in accord with the architecture of the house and with the purpose for which it is being used. There are a great many types of fence patterns available ranging from a trim, white picket fence in New England to a solid, rustic post and rail fence.

for a low western ranchhouse (Plate XVI). Fences can be used on small grounds to replace, in part, hedges and shrub borders that require more room.

It is important in Kansas that fences be of a type that can resist the wind, and that the posts be set deeply and solidly. The material should be resistant to the attack of the weather and insects, either by virtue of the selection of a wood which is naturally durable in contact with the ground or that has been treated to prevent decay and insect injury. The fence should make a good appearance and require a minimum of maintenance.

Fences have been included in the model plan (Plate V). Plain white picket fences were used in keeping with the modified Cape Cod house. Such fences are along the north and south boundaries, and with a hedge and wall, enclose the play area. (Plate XV, Fig. 2 illustrates the fence and gate between the garage and the boundary line.)

Walls often serve as fences, and in areas where native stone is abundant, stone fences are an appropriate means of inclosure. A properly laid stone fence has a great deal of character, especially when vines clamber over it. One disadvantage is the amount of space required, as compared to a wooden fence. High stone walls are not often used in Kansas as they halt the movement of air. They are usually kept down to about three and one-half to four feet for this reason. Retaining walls are used where there are abrupt changes in grade. They cost more initially than a grassed terrace slope but are less

EXPLANATION OF PLATE XVI

Types of fence design.

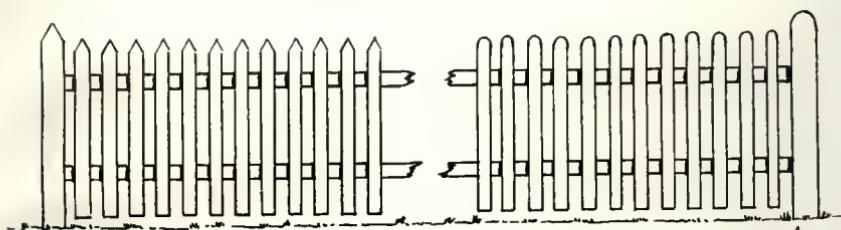


Fig. 1

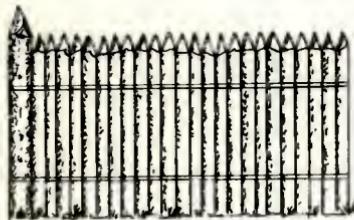


Fig. 2

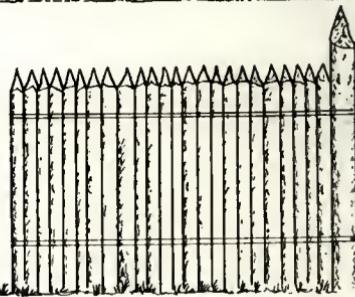


Fig. 3

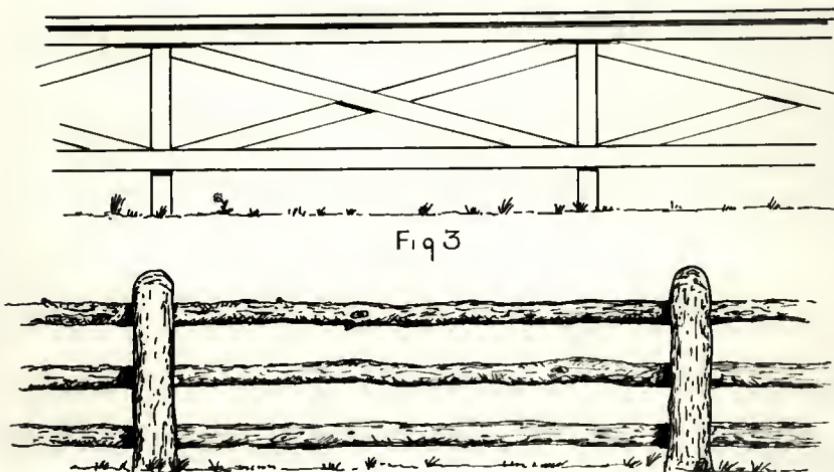


Fig. 4

difficult to maintain. Good rock work is a very pleasing adjunct to the landscape scene. Retaining walls should be at least one third as wide at the base as they are high, and the foundation should be well below the frost line.

A retaining wall was used on the model plan to secure the level of the formal garden on the east (Plate VI, Fig. 1, & Plate X, Fig. 2) and another was combined with the rock garden and the outdoor fireplace on the south. A third extends across the rear boundary to a height of about two and one-half feet to serve as a fence as well as in its primary capacity. A rock wall four feet high divides the service porch and the terrace on the west side of the house. This height insures sufficient seclusion without stopping all air movement.

Hedges of various plant materials also serve as a means of enclosure and have been discussed previously under that heading.

Garden Furnishings and Special Features. Pergolas originated in the Mediterranean countries of Spain and Italy and were used as a passage-way, covered with vines, joining two portions of the landscape design. Their use is confined to the large home grounds as they are out of scale with the small or average grounds. This also applies to garden houses and related structures.

Pools and other water features have been used for centuries in the gardens of the hot countries bordering the Mediterranean. Properly cared for, a pool adds a cooling effect to home grounds in Kansas and in midsummer appears like a tiny oasis. Pools may be formal or informal, large or small. Their size must be

governed by their relation to the area and the size of the grounds. Informal pools should be tucked away in a corner or near a shrub border. Formal pools require a central location in a formal garden area. For safety's sake a minimum depth of thirteen inches to twenty-four inches is best, coupled with a very low (2" to 4") coping. The coping stone should be in harmony with the house, terrace, and other surrounding materials.

Plantings of water-loving plants should be limited in the formal pool but the vicinity of the informal pool can be turned into a very charming area, with Iris, Marsh Marigold, Umbrella Palm, and other similar plants. Fish add to the pool's attractiveness and also eat mosquito larvae. Water lilies can be grown in tubs set in a pool that is about one foot deep. The whole theme of an informal pool is naturalness and nothing should detract from that idea.

A pool should be constructed of reinforced concrete at least six inches thick with the wall foundation well below the frost line. A bed of tamped cinders under the bottom of the slab is beneficial. The lining coat should be of waterproof Portland cement, at least one inch thick. The outlet and overflow may be combined in one pipe threaded at the floor level. The inlet should be inconspicuous, although the water itself may trickle over some rocks to add to the attractiveness of the pool. It is preferable that inlet and outlet valves be conveniently placed near the pool.

Bird baths are a source of much enjoyment to those who like to have their feathered friends about. A bird bath could

be used as a terminal feature at the end of a view in a formal garden and thus fill a dual role.

Trellises, lattices, and arches all serve as support for climbing vines and are a means of displaying the flowers and foliage much better than if the vines were allowed to scramble over the ground. They should be built of a durable wood, be well designed, and be sturdy enough to support the mature vine which is to be grown on them.

On the model grounds (Plate V) between the garage and the north fence is an arched gateway covered with a climbing rose (Plate XV, Fig. 2). Another such gateway stands at the north entrance to the formal garden. Trellises are placed immediately in front of the two clothesline poles and the Clematis on them partly screens the drying yard.

Garden seats, such as the one in the formal rose garden of the model grounds, are useful as seats in which one can enjoy the garden, and they also serve as a terminus of the view from the house and terrace (Plate V, & Plate VI, Fig. 1).

Sundials are a standard feature, especially in the center of a sunny rose garden. One should never commit the mistake of placing a sundial in the shade.

Special gardens. Rock gardens can be very charming supplements to the landscape scene if in a proper setting and if their design follows natural lines. The design of rock gardens has, for some unknown reason, been abused by more well-meaning, but thoughtless people than any other phase of landscape design. All too often one comes upon a mound of many colored rocks

of all shapes and descriptions, inter-planted with large, gaudy plants--in the middle of a flat and otherwise respectable yard.

On the other hand, a rock garden, built on a slope that has had the rocks laid by someone who has taken the time to study natural ledges and rock outcrops in the country and who has planted appropriate small plants among the rocks, is very enjoyable to behold. A rock garden should be located in a corner where it can be a unit in itself. It should be on a slope, preferably toward the south and at least partly exposed to the sun, but not necessarily so. A suitable shrub background provides a setting. Rocks must be arranged naturally, which usually means in a horizontal position and buried about half in the ground, leaving plenty of soil space between for planting. Large or very vigorously growing plants are to be avoided as they will take over the rock garden. It is preferable to use small alpine plants which are in scale with the rock garden. Scale or proportion is the important consideration. In a large rock garden various shrubs may be planted but in a smaller one plant only such dwarf shrubs as will keep their places--and plant these sparingly. Some appropriate dwarf evergreen shrubs are Waukegan and Andorra Creeping Junipers (if not allowed to spread too much), Creeping Mahonia, and Adams Needle Yuca. Suitable dwarf deciduous shrubs are Amorpha, Jerseytea Ceanothus, Anthony Waterer Spirea, and Indiancurrant Coralberry. The smaller perennials should make up the bulk of the planting. A few random samples include: Goldentuft Alyssum, Wall Rockcress, Rose Daphne, Grass Pinks, Evergreen Candytuft, Dwarf Iris,

Ozerk Sundrops, Moss Phlox, Rock Soapwort, Showy Stonecrop, and the many other Sedums. Some of the bulbs are also suitable for the rock garden--Common Crocus and Autumn Crocus, Glory of the Snow, White Fawn Lily, Common Grape Hyacinth, and Siberian Squill. For other rock garden plants, consult the Plant Material Lists.

Such considerations of construction and planting have been used in the rock garden (Plate V, & Plate VI, Fig. 2) on the model grounds. The site is a southern slope and the rocks help retain the terrace above, in addition to serving their rock garden role. They have been placed in a horizontal manner simulating a broken, natural ledge and they tie into the rock wall of the fireplace. The whole area is set apart from the rest of the yard and proper background is provided by shrub plantings.

A wild garden is sometimes made a part of the home landscape if the family has an interest in native plant materials. It, too, should be set aside in some nook or corner and given over exclusively to native shrubs and flowers growing together as they would be found naturally in the wild state. Such a solution has been worked out for the high corner behind the fireplace on the model grounds (Plates V & VII) which, together with the rock garden, provides a very appropriate background for the outdoor fireplace.

CITY HOME PROBLEMS

There are certain problems which are peculiar to the city home grounds and affect the landscape design either directly

or indirectly. The first part of this paper has been written as much as possible in general terms applicable to either the city or country home grounds. The model grounds used to demonstrate the application of these general remarks was placed on the outskirts of a city and necessarily followed more closely a city problem than a country home problem. In keeping the discussion confined to generalities, some of the especial problems of the city home grounds were by-passed and will be discussed at this point.

In many cities there are ordinances which affect the landscape problem. Some limit the distance residences may be set back from the street; and, in certain zoned areas, regulations specify definite cost standards for homes. Having fences or plantings of any sort extending into the front yard farther than the actual foundation planting, is sometimes limited. Regulations in many places specify how close to the side boundaries buildings may be placed. Parkings between the front sidewalk and the street are often maintained by the city, which also extends its jurisdiction over the street trees planted there. Fire regulations may determine the location of the house and the selection of building materials. In the cities where many people are living close together consideration of ones neighbors is necessary.

The size of the city home grounds is often limited, requiring thorough planning for best results. Fences and clipped hedges can be used to advantage since they require a minimum of space. The size of walks and borders--in fact, everything--

is reduced in order to scale things down in keeping with the limited area.

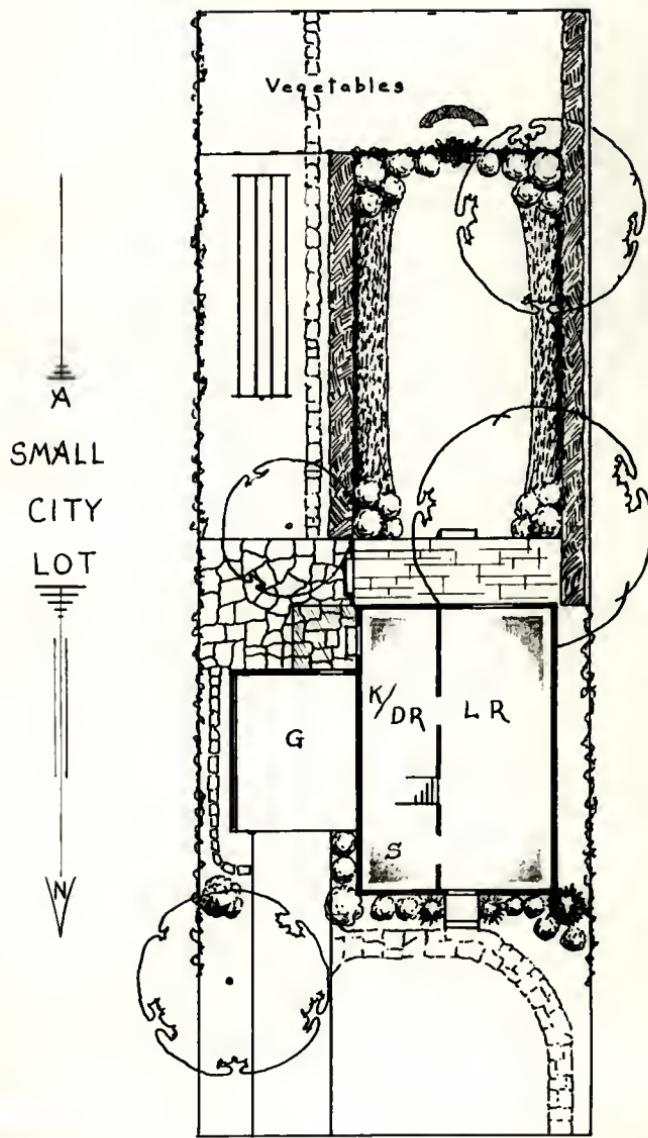
An example of a landscape design for a small city lot (50 by 140 feet) may be seen in Plate XVII. The house and garage utilize all the space across the lot to within three feet of the side boundaries. Small trees are used for enframement in the public area to keep in scale with the small home. Flagstones, level with the grass, make the front walk as inconspicuous as possible and the walk is curved to one side to leave a larger panel of grass in the front yard. All of these things help to make the place appear larger. A picket fence closes the sides and back of this lot. The foundation planting in front is handled very simply, using dwarf plants.

The small rear yard is divided into service and private areas. A flagstone terrace extends across the back of the house with a lower, ground-level court to the left. The kitchen door and a garage door, both under cover of the roof, open onto this court. The court and part of the grass panel beyond can be used as a play area. Beyond this is the drying yard and the vegetable garden extending across the entire width of the lot.

The private area is a simple, nicely proportioned, though small, formal garden, extending from the terrace to a well-designed fence across the rear of the area. Clematis are planted along the fence and a climbing rose covers the arched gateway which serves as a terminal feature for the garden as well as provides proper circulation. In order to screen the view into

EXPLANATION OF PLATE XVII

Landscape design of a small urban home grounds.



the vegetable garden a section of clipped hedge has been planted immediately behind this gate, allowing sufficient room for passage to the right and left. The formal garden is bounded on the sides by a clipped hedge. Shrub groups are planted in the corners and perennial flower borders are placed in front of the hedge. The central panel is an open, green lawn.

Access to the private area is from the living room by way of the flagstone terrace. As this terrace is on the south, a large deciduous tree planted immediately south and west of the terrace shades it thoroughly in the summer but allows the sunshine to enter in the winter. In addition, this tree serves as background for the house. This plan provides for a very liveable solution to the problem of making the best use of such small space.

FARM HOME PROBLEMS

While much of the material covered in the general discussion is applicable to the landscape problem of a Kansas farmstead, there are a number of additional topics that must be considered in order to clarify that problem.

In planning a farmstead that is both convenient and attractive, much emphasis must be laid on convenience because the group of buildings comprising the farmstead includes not only the farmer's home, but his office and business plant as well. Attractive surroundings are fully as important on the farm as elsewhere, however.

Cleaning up an old farmstead is usually a big job in itself.

Not only should rocks, rubbish, and brush be removed from the vicinity of the house but usually disposition must be made of a few old tumble-down sheds and numerous pieces of old machinery.

A map of the area is, of course, made; indicating the farm buildings, trees, drives, and other permanent fixtures. This map should be available when planning the relocation of drives, fences, etc., and also when making the landscape design involving new plantings.

The landscape plan begins with the basic considerations previously discussed; the first of which is orienting the house. When building a new home or remodeling an old one, placing the right rooms on the proper side of the house with reference to sun and winds of both winter and summer is important. Equally important is the proper orientation of the buildings of the farmstead group in reference to each other. Some thought on this matter brings the fragrance of a hayfield or the scent of an orchard in bloom into the house on the evening breeze instead of the barnyard aroma.

Plate XVIII illustrates methods of arranging buildings and drives in order to eliminate odors, minimize fire hazards, reduce dust, and provide convenient access to all units of the farmstead.

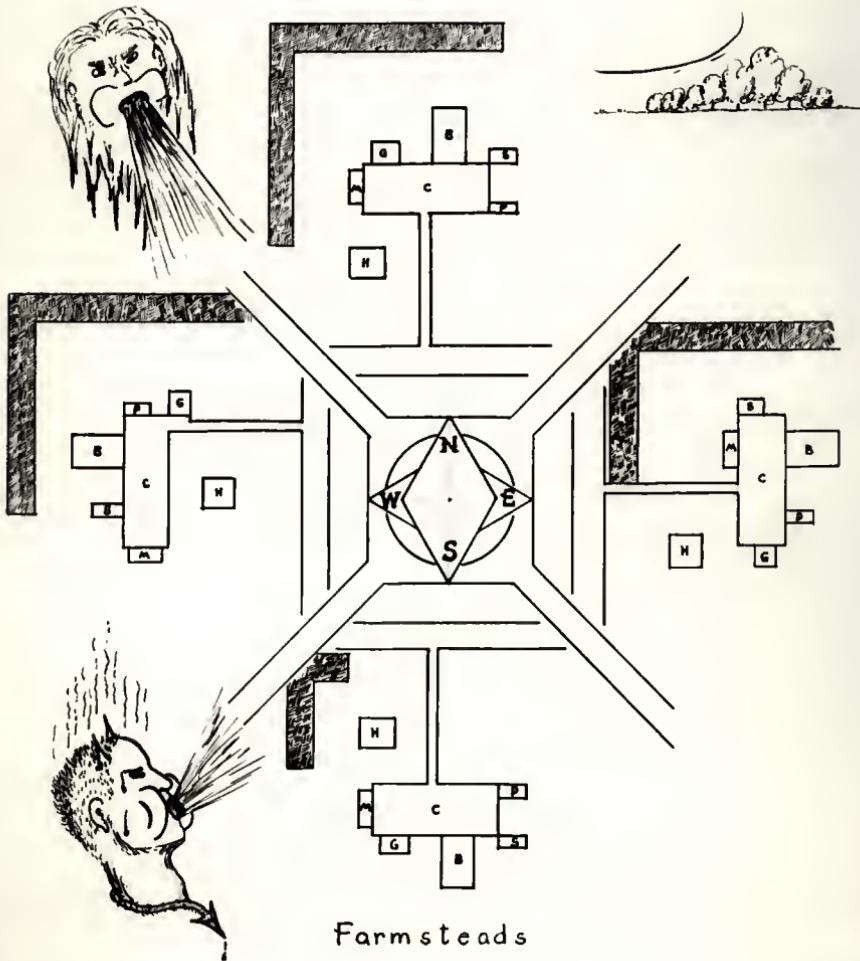
Four model farmsteads facing the four cardinal points of the compass are used to illustrate these points. The example of the farmstead facing south has the house located one hundred feet from the highway (should be 150 feet if the highway is not surfaced) in order to avoid disturbances. The driveway is

EXPLANATION OF PLATE XVIII

Disposition of farmstead buildings, drives, and windbreaks with reference to seasonal prevailing winds. The four farmsteads illustrated face the four cardinal points of the compass.

Key

B - barn	M - machine shed
C - farm court	P - poultry house
G - granary	S - swine house
H - home	

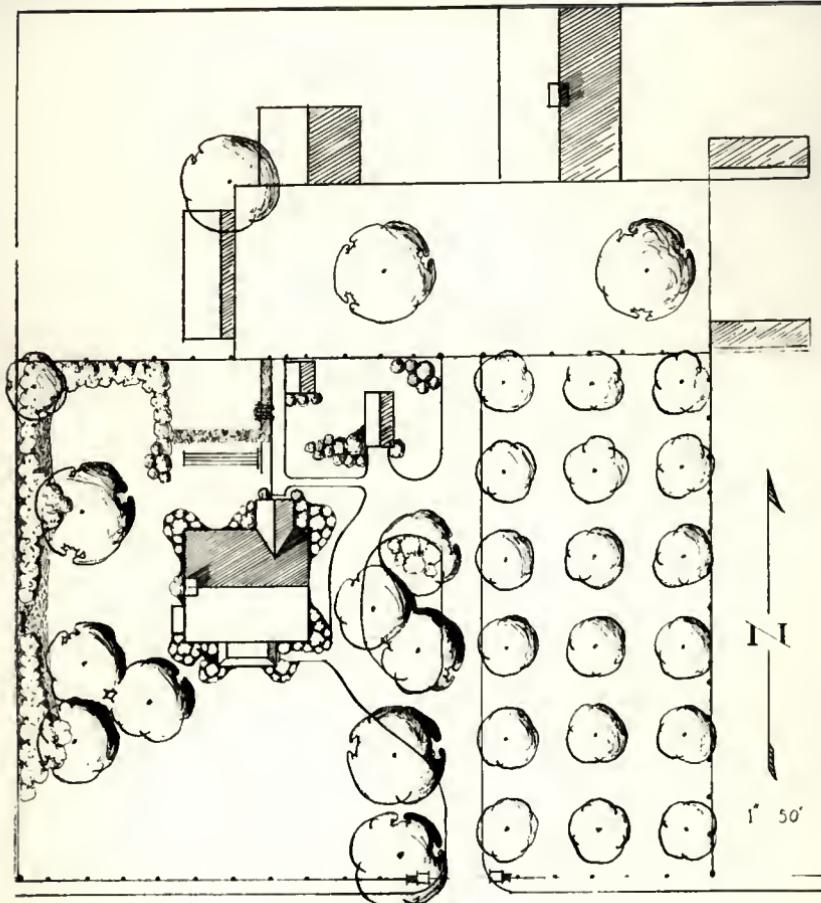


placed east of the house rather than west so dust from the drive will not be likely to settle on the house, due to the fact that the prevailing winds through most of the summer months are from the southwest. The other buildings--barns, etc.--are grouped to the north and east so the southwest summer winds and northwest winter winds will not carry any disagreeable odors to the house. To the north, the machine shed and granary are located; while the barn, hog-house and poultry-house are placed on the east end of the farm court. A windbreak placed to the north and west of the farmstead gives it winter protection. It extends only far enough along the west boundary to do this without cutting off summer breezes. A study of the other farmsteads indicates that in each case buildings which may emit unpleasant odors have been placed where prevailing winds--especially summer winds--cannot carry such odors to the farm home. It will also be noted that driveways are placed either north or east of the house in order to avoid dust. Windbreak patterns necessarily vary according to the direction in which the farmstead faces. All utility buildings of the farm group are placed about an open courtyard which facilitates feeding and care of livestock and use of machinery.

Having planned the general arrangement of the buildings, the next step is the landscape plan. Plate XIX is one solution of this plan for a farmstead facing south. As the farmer combines his business and his home, one of the first considerations is the practicability and convenience of the buildings. The circulatory system of driveways and walks is highly important.

EXPLANATION OF PLATE XIX

Landscape plan of a Kansas farm home grounds,
including an elevation study.



The driveway should proceed directly from the road or highway to the farm courtyard with a branch drive connecting the house and garage. The main driveway and gate should be wide enough to accommodate all possible farm machinery. Surfacing with sand or gravel will prove very beneficial. The branch drive should be far enough away from the main drive (60 feet over-all) so that a car can be turned around. It should make contact through walks with both the front and back doors of the house. This drive is very convenient because it allows passenger cars to be parked on it, leaving the main drive free. The garage should be close enough to the house to be handy, yet far enough away to reduce fire hazards. The main drive proceeds to the farm courtyard which should be large enough for trucks to be turned around and farm machinery to be moved in and out of the machine shed with ease. It should be fenced off to keep the farm animals from wandering about trucks or farm machinery parked in the area. The open farm courtyard, except for a shade tree or two, facilitates feeding operations and handling of grain and machinery. In addition to the walks which connect the branch driveway, a service walk proceeds directly from the back porch to the farm courtyard. This system of drives, walks, and courtyard provides adequate circulation for most farms.

The farm buildings are grouped about the courtyard and related to the house in the manner previously described. A small farm orchard of eighteen assorted fruit trees and a large garden space should provide the farmer with adequate fruit and vegetables. In addition to the large garden a small kitchen

garden is provided near the house. A windbreak protects the north and west sides of the farmstead.

The last point to be considered is the landscape plan of the grounds adjacent to the house. This entire area should be fenced to exclude all poultry and farm animals. The fence to the rear end sides might be woven wire and high enough to discourage chickens. A tight, neat combination of barbed wire and woven wire fence immediately in front of the house is fine, if properly maintained. However, a post and rail fence or a paddock fence (Plate XVI) would add something to the general picture as would a well-designed field-stone entrance gate. An occasional vine that is not too vigorous, planted where it could climb over the rails here and there would relieve the monotony of the fence pattern.

The public area or front yard is an open expanse of green lawn which is not cluttered up with assorted geometrical flower-beds, chicken coops, and farm machinery. By keeping it simply a nice lawn, mowing is made much easier; in fact, most of the grass can be cut with the farm horse or power mower except for a little trimming about the house, shrubs and fences.

Trees are grouped on either side for enframement and shade. The group southwest of the house shades it during the afternoon, and if the trees are naturally high-trunked or pruned to this form, they allow the southerly breezes to get through to the house. The group of trees east of the house shades much of the driveway.

The foundation planting is not elaborate but planned to

properly relate the house to the grounds.

To the west and northwest of the house is the private area where the family can relax in the cool shade after supper and enjoy the grounds and the flowers. In line with the side door from the living room is a perennial flower border backed by shrubs and with a well-designed trellis upon which a Paul's Scarlet climbing rose terminates the view. The tree and shrub plantings afford privacy in this area. To the north, is an extension of the private area enclosed by a shrub border and including another perennial flower border. If the family desires, an outdoor fireplace, such as described in Plate VIII, could be placed in this area.

The service area includes the drying yard close to the kitchen, a small kitchen garden for the housewife's convenience, the windmill (or the well-house for the pumping system), the garage, and the walks to the farm courtyard.

Sufficient grading should be done to insure drainage away from the house and well-house so that no surface water, especially from the barns, flows to them.

If these suggestions are considered in planning a farmstead it should be a convenient and pleasant place in which to live and work and one that is attractive to the owner, tenant, or passer-by. The appraised value of a well-organized place is also much higher than that of one that "just grew" like Topsy. With proper planning and budgeting, the cost of such a program as well as the work could be extended over a period of several years.

Having studied the landscape problem of the location of plant forms in relation to the house and other facilities in order to fulfill the needs of the design; the allied problems of selection, planting, and care of appropriate trees, shrubs, vines, grasses, and flowers logically follow.

Selection

In the selection of plants adapted to Kansas one cannot follow a better guide than Mother Nature. She has tested many plants and those which have passed her tests have been perpetuated. They are found on the hills, the prairies, and along the streams. It is true that many other plants have been introduced and found to be perfectly at home here but let us consider the native plants first.

It is far better to have a fine redcedar which you know will grow and live for years than an exotic, such as a hemlock, which is a nice tree in the East but is not adapted to Kansas. Such "strangers" are interesting, but they just do not fit into the Kansas picture. American Elm, Hackberry, Sycamore, and the native oaks (Bur, Pin, Red, White) are certainly among the best shade trees for this state. Where can you find better growth and shape than that of the spreading American Elm? Where better color than in the brilliant fall leaves of the oaks? From early spring until late fall the native plants of Kansas provide a varied and colorful picture which is even carried into the winter by the blood-red twigs of some of the dogwoods, the white

bark of the Sycamore, and the bright orange fruit of the Bittersweet.

Before the trees leaf out, the Fawnlily or Dogtooth Violets and the true Violets, as well as the dainty Dutchman's Breeches appear in the forest floor raising their foliage and flowers among the old leaves. Above them, the Redbud's delightful pink flowers are bursting into bloom along the streams and fence-rows. Having started the parade they are soon followed by many others. Out on the plains the Prairie Crabapple blooms mingle with those of the Sand Plums. Soon the White Bloodroot blossoms appear in the woods, the trees leaf out, the grass becomes green; and while spring merges into summer, the Bladdernut, Fragrant Sumac, blackhaws, and gooseberries bloom. Blue Wild Indigo, yellow Ozark Sundrops, and yellow and red Painted Gaillardia appear as the season progresses.

Summer finds a wealth of native plants in bloom. The Prairie Rose produces its large, single, pink blossoms, and Indigobush Amorpha its blue spikes. The American Elder blooms and is covered with large heads of white flowers. Along the water's edge is the Buttonbush with creamy white flowers and glossy foliage. The bright orange of the Butterfly Milkweed vies with Purple Echinacea on the hillsides, while yellow Coreopsis dances in the breeze.

Indian summer, with its hint of fall, is a time of color indeed. Kansas' Sunflowers lift their golden yellow heads in worship of the sun, as do the Heleniums or Sneezeweeds. The yellow Gaillardias, purple Kansas Gayfeathers, blue Spiderworts,

scarlet Cardinal Flowers, and yellow Goldenrods provide a riot of color.

As the frosts go to work, blue Asters and Mistflowers usher in the flaming colors of autumn and the spotlight shifts to the vines, shrubs, and trees. The Silver and Sugar Maples contribute yellows and reds; the Green Ash, Black Walnut, and Red Mulberry become yellow; and the oaks furnish the red pigment for Mother Nature's palette. To this she adds a dash of gold from the Soapberry fruit, red from the Sumac leaves, orange from the Bittersweet, blue-black from the Blackhaws, and paints a canvas of exquisite beauty.

Most of the native plants mentioned are worthwhile landscape plants, and will be found included in the Plant Material Lists at the back of this paper. All native plants in the lists are designated by an asterisk. This recommendation does not carry with it the suggestion that everyone dash out to the closest woods and dig up a truckful of these plants for his yard. He would be disappointed when most of them died. Usually, they serve a better purpose where they are growing. Native seedlings of woody plants have long, deep root systems, poorly adapted to the shock of being cut off and transplanted. Rather it is suggested that these plants be purchased from a reliable, established nursery. Most nurseries grow a large number of these very plants as they realize that such plants are among the most adaptable. In addition, they are properly root pruned (Plate XX, Figs. 1 & 2).

Plate XX shows a nursery grown tree which has been properly

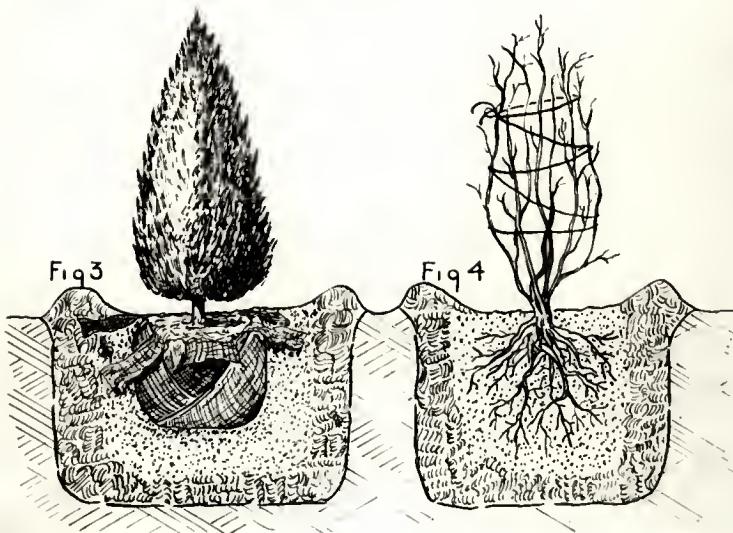
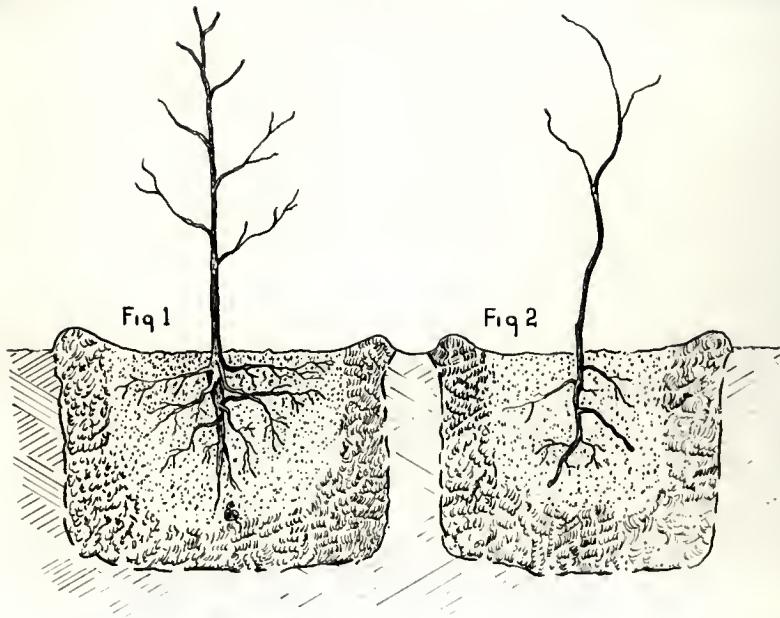
EXPLANATION OF PLATE XX

Fig. 1. A properly grown deciduous tree planted bare rooted. Note shape and good root system.

Fig. 2. A native deciduous tree transplanted from the wild state. Note shape and poorly developed root system.

Fig. 3. A coniferous evergreen transplanted with a ball of earth secured with burlap.

Fig. 4. A deciduous shrub with the branches tied up for convenience in transplanting.



pruned as it grew, in order to shape its central leader and provide well-spaced lateral branches. In addition to this pruning of the top, it has also been root-pruned, which results in the growth of a concentration of roots near the crown. This tree will have a far greater chance of growing than the tree in Fig. 2 which was dug from a woods. The latter is not very well-shaped and although a deep hole was dug when obtaining it, it does not have a good root system. If both trees are given good treatment the first one will become established and grow much faster than the second.

Some of the best landscape plants, on the other hand, are ones that have been introduced from elsewhere and have found Kansas a good place in which to live. Some of these are Pfitzer Juniper, Austrian Pine, Spreading Euonymus, English Ivy, Japanese Barberry, Peking Cotoneaster, Amur Privet, Tatarian and Winter Honeysuckle, the spireas, lilacs, daffodils, and Evergreen Candytuft.

The Plant Material Lists have been prepared in order to suggest some of the plants that do well in Kansas, or in certain designated areas of the state, if given reasonable care. These lists are by no means complete, but are sufficiently comprehensive to provide one with enough of the various types of plants to landscape the average home grounds.

General hardiness is influenced by many factors. The climatic factor of temperatures places rather strict limits on plant distribution. Certain plants can withstand the high summer temperatures of Kansas but are killed by low winter

temperatures, while certain other plants live through the winter and are killed by the summer heat. Extremes of temperature for the state vary from about 121° to -40° F., while the average annual temperature is 55° F. (8). One of the dangerous caprices of the weather that is harmful to plants is the late spring freeze which catches eager plants in leaf or blossom after weeks of mild weather. This sets them back and may permanently injure them. The average date of the last killing frost in spring falls in the month of April or the first week in May (8).

In addition to the general hardiness or adaptability of plants, such environmental requirements as soil, moisture, and light demand attention.

The majority of ornamental plants is not too particular about soil requirements and almost any good friable soil containing some organic matter provides them with an appropriate growing medium. Some plants such as peaches, walnuts, Japanese Anemones, Sweet Peas, and Garden Pansies prefer a rich soil; others seem to thrive on less fertile soil. Certain plants--Kentucky Bluegrass, for example--like lime (of which most Kansas soils have plenty). Members of the Heath family are not generally grown here because they require an acid soil.

Specific soil requirements are briefly indicated for each plant in the Plant Material Lists. It must be emphasized that where grading has been done, sufficient topsoil (6") must be used over all to insure a good lawn and more (2' to 3') should be used where trees and shrubs are to be planted.

The problem of moisture is one that influences plants in

Kansas both winter and summer. Drying winter winds damage plants to a certain extent some years, and of course summer drouths are very harmful. Many people have discovered the benefits of thoroughly watering trees, shrubs, and perennials after a dry fall. Plants need some moisture even though dormant, and many of them are actually busy growing roots late in the fall and early in the spring.

Summer drouths have been very severe in this state and much plant material has been killed outright or severely injured. Especially in western and central Kansas where rainfall is not plentiful, care must be taken to see that plants selected are of a kind that can stand some drought; that they are given plenty of water the critical first year they are planted; and that later, water is supplied when dry weather comes. The average rainfall for western Kansas is about sixteen inches. This figure rises to about forty-two inches in southeastern Kansas (8). Most of the rain falls in the warm season.

Some plants requiring less than average moisture are Yucca, Prairie Crabapple, Black Locust, Siberian (Chinese) Elm, Siberian Peashrub, Fragrant Sumac, Lilac Chestnut, Chinese Wolfberry, and Butterfly Milkweed. On the other hand, English Ivy, Sugar Maple, River Birch, American Sweetgum, Common Buttonbush, American Elder, White Fawnlily, and Siberian Iris require more than the average amount of water and should be planted in appropriate places with that in mind. (Cases in which these moisture requirements are pertinent are checked in the Soil Column of the Plant Material Lists.) Plants in

general, should be watered when necessary and then thoroughly soaked, rather than squirted a little each evening as is so often done. The latter method encourages roots to grow near the surface where they are easily killed by drought.

Light is as essential for the proper growth and functioning of a plant as is water and food from the soil. Everywhere we see the struggle for light. A vigorous weed in the seedbed shades many seedlings and unless it is pulled it will completely shut off the light and "shade out" the plants beneath it.

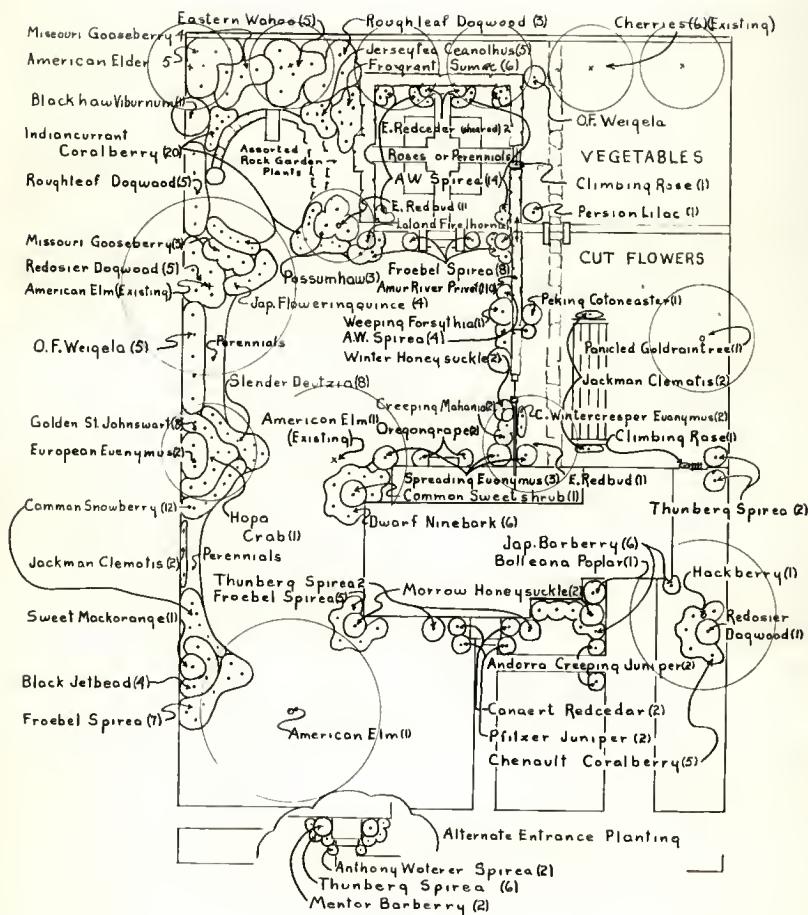
During this timeless struggle some plants have stubbornly held on in the shade and we call them tolerant or shade-loving. A knowledge of this characteristic is important when selecting plants to be grown in certain situations of sun, partial shade, or shade. (Note is made of this in the Plant Material Lists under the heading Exposure.)

Most of the coniferous evergreens require sunlight for best development and yet one can see examples on every hand in which people have planted redcedar or arborvitae on the shady, north side of the house under a shade tree, and hemmed in by shrubs. In a year or two these trees will become straggly skeletons of branches with only a tuft of sickly foliage here and there. Conversely, shade-loving plants when placed in full sun will "burn up", as do English Ivy, Common Periwinkle, Vernal Witch-hazel, and Plentainlilies.

A study of the planting plan (Plate XXI) for the model home (Plate V) will indicate how this problem of selection for use may be combined with the selection of plants appropriate

EXPLANATION OF PLATS XXI

Planting plan of the model home grounds with the plant materials indicated by their common names followed by a number in parenthesis indicating how many plants are to be placed in the area designated by the arrows.



the conditions of exposure.

Planting

All of the planning will be to no avail unless proper attention is given to the actual planting of these trees, shrubs, and flowers; which involves a little more than digging a hole, placing them in it, covering the roots, and watering. These are the bare essentials only, and the success or failure of the process may depend on other factors.

Handling prior to planting. Insuring a good root system has been mentioned previously, but bears repeating. Most nursery stock, from reliable concerns, will have a good root system and it is shipped with moist packing about the roots and at a time when the plants are dormant (after the leaves drop in the fall and before they appear in the spring) so the plants are disturbed as little as possible. If they are to be planted within a few days, they should be placed where they will not freeze and checked to see that the packing and the roots are sufficiently moist. If planting will be delayed for some time, plants should be "heeled in" (Plate XXII, Fig. 1). A trench with a sloping bank and large enough to accommodate the roots is dug, and the small trees are unpacked and placed with the roots in the trench and the tops almost parallel to the earth's surface. The roots are covered with the soil which should be pulverized and tamped in about them to insure against air-pockets. The job is completed by thoroughly watering the soil about the roots. Plants should not be left heeled in for extended

EXPLANATION OF PLATE XXII

Fig. 1. Trees being placed in a "heel in" trench.
Fig. 2. Balling and burlaping an evergreen.

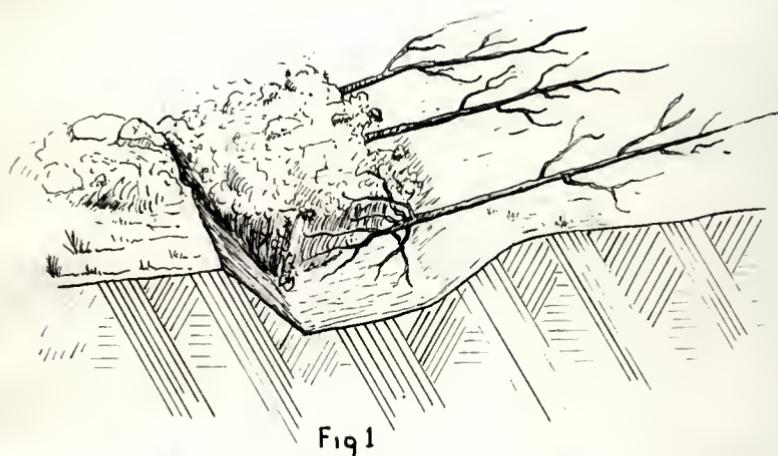


Fig 1

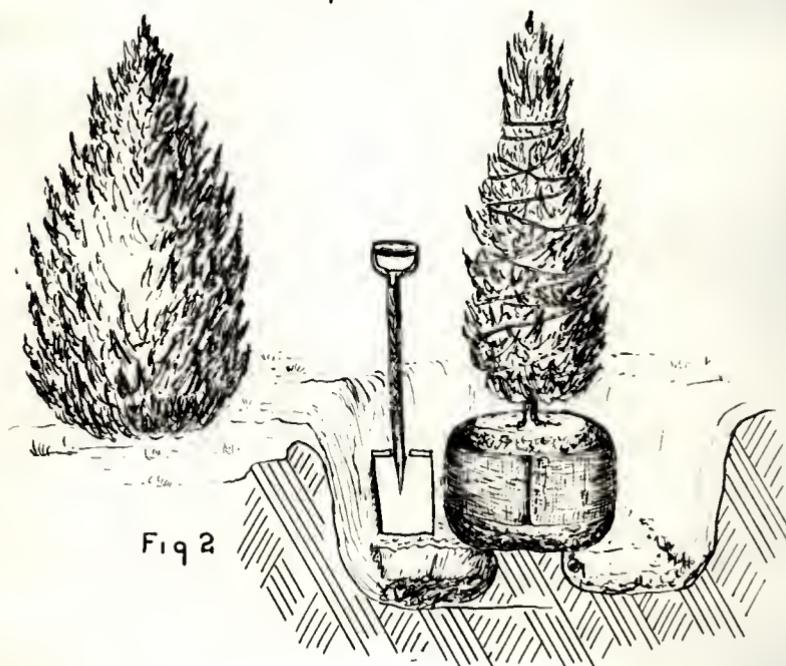


Fig 2

periods, but must be planted before they start to leaf out.

The preceding paragraph pertains to deciduous plants that drop their leaves in the fall. Evergreen trees and shrubs are handled differently. They require "balling and burlap". Most of them come from the nursery in this manner, designated as B & B, with a firm ball of earth about the roots held securely in place by a snug burlap wrapping. This is for the purpose of minimizing injury to the root system, especially from drying, which is extremely important with evergreens.

For those who have occasion to move existing evergreens that are not too large, this process will be explained. Do not attempt to move large evergreens; leave that to a professional nurseryman. The first step is to loosely tie the foliage with burlap or bindertwine so it will be out of the way (Plate XXII, Fig. 2). Then the outline of the top of the ball is marked with a sharp spade. Digging is begun outside that circle with the spade blade held with one edge toward the tree trunk as this disturbs the ball the least. As digging progresses, the sides of the ball are kept smoothly shaved by the spade blade and later supported with a band of burlap fitted snugly and fastened by nails used as pins (watch them when handling). The size of the ball should be in proportion to the tree as is indicated in the sketch. When the digging has progressed sufficiently and the band is placed securely, the ball is undercut and a piece of burlap is slipped under it and fastened tightly around it to complete the process. A simple way to carry the tree is to slip another piece of burlap under the ball and use

the corners as handles. Care should be exercised in handling to prevent cracking the earth ball, which would break roots and allow air to enter.

Such B & B plants can be held a few days by placing them beside the house, out of the wind and in the shade, and keeping the balls moist--not wet, as this will dissolve them--and packed with straw to prevent excessive freezing or drying as the case might be.

If certain plants desired are not available from a nursery and they can be located in the wild, permission should be obtained from the landowner and arrangements made before proceeding. Transplanting should be done in the late fall or early spring while plants are dormant. Small trees under six feet and shrubs under four feet can be moved with more success than larger ones. Care should be exercised to insure getting a large proportion of uninjured roots. These should be packed in moist packing and wrapped with burlap while being moved. In order to insure better results it is advisable to select a plant in the fall and top prune it some, and also root prune it by cutting through part of the roots with a long bladed tiling spade, just inside the area to be dug later. It is then left until the following fall and as a result of the root pruning it will have a greater concentration of roots and will stand the transplanting better.

Native perennial flowers are easier than shrubs and trees to transplant as it is feasible to dig them with a ball of earth and get a larger percentage of the root system intact. Many nurseries grow their perennials for sale in tarpaper pots which

facilitates moving and insures getting a good root system that is undisturbed.

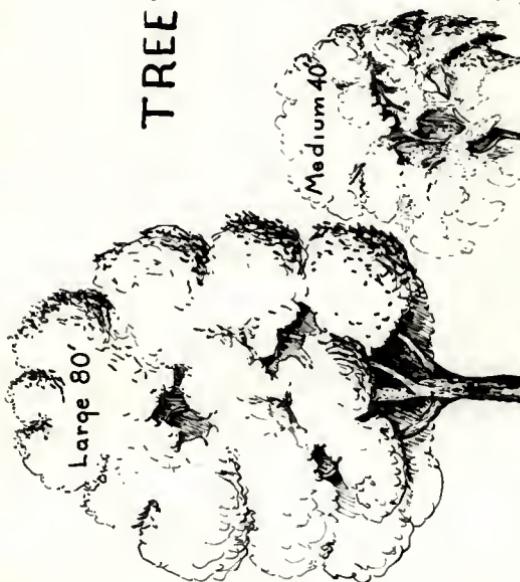
The planting operation. Equipped with the planting plan showing the location of the selected shrubs, the next step is to stake out the position of the plants on the grounds. This requires a knowledge of spacing, which is also necessary when drawing the landscape plan. Plate XXIII graphically explains general spacings which are suitable for most situations other than windbreak or hedge plantings. It is at this point that care must be exercised to keep from planting too thickly. A Tatarian Honeysuckle from the nursery may be only three feet high and with only three or four main branches but it must be remembered that given time it may be ten feet high and six or seven feet across.

With the stakes properly located, the actual planting can begin. Existing sod is first removed from the hole area or the entire planting bed in the case of a shrub border. In digging the hole the good topsoil should be placed to one side and the less desirable soil to the other side of the hole. The hole should be large enough to accommodate all the plant's roots without crowding and it is good practice to make it even larger. The plant, tree, or shrub, which has been kept in the shade with the roots covered with wet burlap, is checked, and any bruised roots are pruned off and the top is pruned (not dehorned) so that a balance is reached between the roots that supply water and the top that uses it (Plate XXI, Fig. 1). The hole is partially filled at the bottom (this extra digging gives

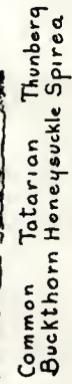
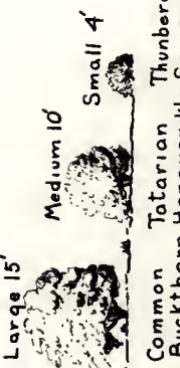
EXPLANATION OF PLATE XXIII

A diagrammatic chart illustrating proper spacing for trees and shrubs for best development in other than hedge or windbreak plantings.

TREES



SHRUBS



SPACING

Examples: Silver
Maple

40'-60'

20'-30'
(Approximate)

American
Yellowwood

Corneliancherry
Dogwood

Tatarian
Buckthorn

Thunberg
Honeysuckle

Spirea

10'-15'

7'-10'

5'-6'

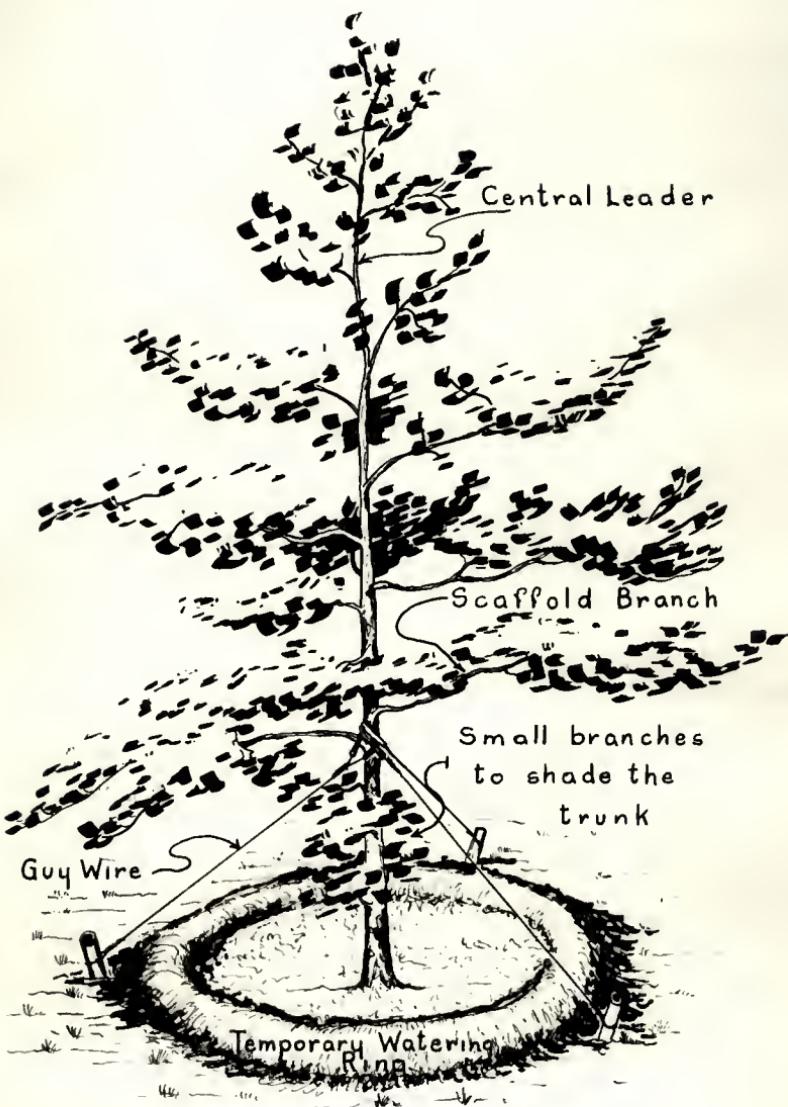
2'-3'

the roots a better chance to get off to a good start) with good topsoil. Well-rotted compost may be thoroughly mixed with this topsoil but no fresh manure or strong inorganic fertilizers should come in contact with the roots. This mixing is also necessary to get the soil into a friable state so that it can be easily worked about the roots, avoiding air pockets. The soil should be tamped as the filling proceeds. The topsoil should be used under and about the root system and the other soil is placed around the edges of the hole. Check the roots as the hole is filled to see that they remain in a natural, spreading position. When three-fourths full, run water into the hole to fill, and let it soak in; then finish filling the hole leaving an earthen ring about the tree, and water again. When thoroughly settled the plant should be just slightly deeper than it stood in the nursery. The temporary watering ring should be removed later, leaving a slight concave depression to catch water. It may be necessary to give trees some additional support until established, if they are over six to eight feet tall. One method is to fasten three ropes or wires to the trunk and to three equidistant stakes (Plate XXIV, Fig. 2). A section of old garden hose or other material is essential to protect the trunk from the guywires.

Evergreen trees and shrubs (B & B) need special handling. When the hole has been dug as before, these plants are planted--ball, burlap, and all (Plate XXI, Fig. 3). The topsoil must be filled in and tamped to a depth that will accommodate the ball, leaving the plant at the same depth as it formerly grew.

EXPLANATION OF PLATE XXIV

A young tree properly braced and prepared for watering. After the tree is established, the guy wires and temporary watering ring should be removed, leaving a slight depression about the tree.



The ball is placed in the hole and topsoil is filled about its base, and tamped. Then the burlap at the top of the ball is loosened and pulled back from the trunk. All of this burlap will soon rot and disappear. The rest of the procedure is as mentioned in the previous paragraph, except that the binding materials which supported the branches are removed after planting.

Many evergreens can be moved in Kansas in September as the heat and dry weather of August have forced them into semi-dormancy. If the weather is dry this procedure is not recommended, but if fall rains are beginning, September is an ideal time because the plants can get settled and grow some new roots before winter. If properly handled, evergreen plants may be moved almost any time in the fall or the early spring as soon as the ground is workable and before the beginning of warm weather.

Deciduous trees and shrubs should be moved when dormant, after they drop their leaves and before the buds swell in the spring.

It pays to give roses a little special attention because of the excellent quality of the flowers. Roses should be planted in the early spring as soon as the ground can be worked. The location should be exposed to full sunlight at least half of the day. Roses prefer some protection from the Kansas wind. A rose garden bordered by a wall, or a hedge which does not have greedy roots, is ideal. Roses should be planted in a good, well-drained soil, and water should be available for them. This

soil should be good garden loam turned to a depth of a foot and a half and with well-rotted manure thoroughly mixed into the bottom ten inches. The plants must be protected at all times in wet burlap. They should be carefully pruned to remove all broken, skinned, or diseased branches and roots. The tops should then be cut to about three to eight inches or three to five buds. Dig the hole large enough to receive all the roots without cramping. Carefully work the well-prepared soil about the roots and be sure that the grafted area of the stem is below the surface. The union of top and rootstock is usually noticeable as a swollen joint. Unless it is somewhat below the ground, sprouts bearing undesirable flowers may appear. As the earth is filled in, it should be pressed firmly around the roots. The plants are then watered and after the water has soaked in, the bed is raked lightly. Hybrid Teas should be spaced about eighteen inches apart in the bed and Polyanthas and Floribundas about twelve to fourteen inches.

During the winter months soil should be mounded about ten inches around each plant for protection and left in this condition until the ground freezes. Straw is then scattered over the bed and held down with chicken-wire or branches. In the spring when it is all removed, some of the straw should be put back around the uncovered plants for several days to accustom them gradually to their new condition.

Lawns may be started in a number of ways--by sowing seed, planting plants or pieces of plants, or by the laying of grass sod. A primary requirement is a soil that has been properly

graded (as previously discussed) and finished with good topsoil. Preparing the soil prior to planting should include improvement of its physical state, its fertility, and the elimination of weeds and weed seeds. The topsoil is important because a majority of grass roots are usually in the top six inches of soil. This soil should be of a texture which enables it to conserve moisture. Here in Kansas a heavy loam topsoil is better than a light or porous soil, and a clay loam subsoil also retains moisture. Clay added to porous soil, and sand to tight soil will tend to bring these soils toward a better physical state.

Weeds and weed seed are best eliminated by plowing the ground in the late spring before any weeds have set seed, and then keeping the soil cultivated and free from weeds until planting time. Fertility may be improved by edding some well-rotted barnyard manure to the soil before plowing.

Such preparation will have the ground in shape for seeding Kentucky Bluegrass in the fall. Sometime in September, before the fall rains, is a good time. Only the best seed, of high purity and germination, will give good results. Fall sowing will give it a chance to get started before winter and in the spring it will be able to start growing well before weed competition becomes a factor. Also, moisture conditions favor fall planting as compared to spring planting when the tender, young plants struggle against summer heat, drouth, and weeds.

Beginning with a well-prepared topsoil, raked, and in good shape, the seed may be drilled or broadcast at the rate of two pounds of high-test Kentucky Bluegrass seed per 1,000 sq. ft.

If broadcast, half of the seed should be broadcast while walking in one direction and the other half while walking at right angles to the first direction. Perennial rye and redtop are sometimes mixed with bluegrass advantageously (25% rye, 25% redtop, 50% bluegrass). This makes a better stand under varied growing conditions. The area is raked to cover the seed lightly, then rolled, after which it is watered gently but thoroughly and kept moist until the plants are well established.

A bluegrass lawn may be sodded where an immediate effect is desired. This is an expensive operation unless plenty of clean turf is available to furnish the sod. The soil is prepared as before, but in the fall, and lightly rolled just before planting. The sod is cut by placing a convenient length of twelve inch plank on the turf and cutting along its edges with a straight edging tool or push hoe. These strips are then undercut at a depth of one inch or slightly less and carefully rolled into rolls that can be conveniently handled (Plate XXV, Fig. 1). Such thin sod is light and contains enough roots to enable the grass to come back into the area. Keep the sod moist but not wet. These strips are laid at right angles to the general slope of the lawn and about one inch apart. Good soil is tamped into the cracks and scattered over the whole sodded area and lightly raked to generally even the surface. Strips are secured to slopes with small, wooden pegs. The new turf is rolled to insure good contact with the soil, and then watered, and as if by magic (and a lot of work) a mature lawn is "born". The best time to sod bluegrass is in the spring when the grass has begun

EXPLANATION OF PLATE XXIV

Fig. 1. Cutting bluegrass sod.

Fig. 2. A compost pile.

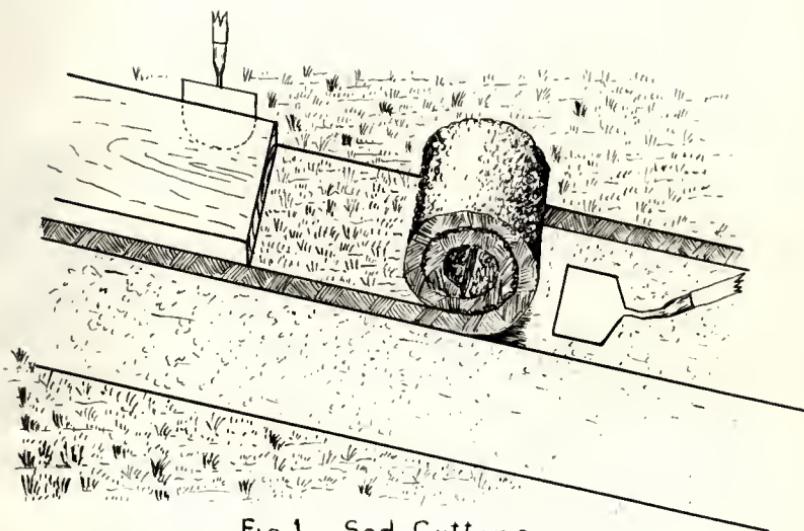


Fig 1. Sod Cutting

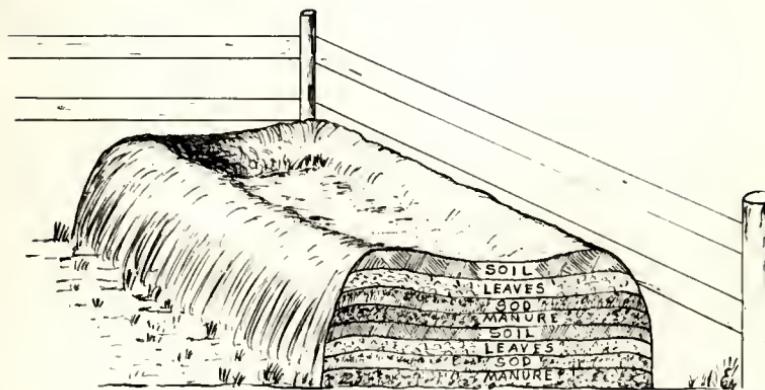


Fig 2 Compost Pile

growth and after heavy freezing weather has passed.

Buffalo grass can also be sodded in the early spring. Western Kansas farmers should have little difficulty obtaining sod as many pastures have acres and acres of pure buffalo grass. Sods should be three and one-half to four inches thick. Where considerable sod is needed, a steel cutting blade four inches deep and twelve inches across, attached to a plank sled will facilitate cutting. Strips should be cut at right angles to the pasture slope and alternate strips are left to recover the bare areas. Keep sod moist but not wet. Sod may be placed as for bluegrass, for an immediate effect, but less sod will be required if it is cut into three to four inch squares and these planted in an alternate, checkerboard pattern in rows one and one-half feet apart, even with the surface. Water the area until established and thereafter only in dry weather. If pure turf is not available, the plants may be dug out individually, torn into pieces, and kept moist until planted in shallow furrows, tamped, and watered.

Bermuda grass is usually planted in the spring in soil that was plowed in the fall and worked into a good seed bed. The long, underground stems, or rhizomes, are dug, kept moist, and planted in two-inch furrows three feet apart. These are covered, the area leveled with the back of a rake and then rolled and watered. Competing weeds must be kept down and moisture must be supplied until the grasses are established (See Kans. Agr. Expt. Sta. Bul. 267. May 1934).

Care

Some people enthusiastically plan and plant but fail to maintain their home grounds. This maintenance must be considered if all of the benefits of previous efforts are to be extended over the years. Having established a comfortable, well-landscaped home grounds a little effort applied regularly (watering, cultivating, fertilizing, trimming, and pruning) will pay large dividends.

Water. In Kansas, dry winters sometimes kill almost as many plants as do arid summers, yet few people realize this fact. Summers are usually dry and if fall rains are light and little snow falls, the drying winds sweeping across the prairies soon reduce the moisture content of plants to a dangerous point. This results in the death of portions of the plant or even the entire plant during the winter or the following spring. To avoid such injury moisture must be supplied in the late fall after top growth stops. If plants are watered too early in the fall, while still growing, they will put out new, soft growth which will winter-kill.

Everyone is familiar with our summer drouths and their effects upon crops as well as ornamental plant materials.

To be effective, water must be applied slowly so that all of it soaks in and does not run off, and for a sufficient length of time to soak the soil thoroughly to a depth where it will be of most value to the plants. This cannot be over-emphasized. If watering is thorough, roots grow down and when dry weather

comes they can tap what moisture is deep in the soil even though the surface soil may be dry. It is a good idea to dig into the soil the next day after watering (allowing time for water to soak in) and see just how the water penetrates in a given soil. Local conditions determine how much and how often water should be applied.

Newly planted material must be watched carefully to see that it has plenty of water, especially the first year, and during dry periods thereafter. Earthen dams may be thrown up around trees and the basin flooded repeatedly until the soil is sufficiently wet. Another procedure involves the placing of several three or four inch tiles, one or two feet in the ground, vertically, with the bell top flush with the surface. These should be filled with coarse gravel and a green, wooden cap fitted in the cupped top to keep the tile from filling with sediment. Watering through these tiles overcomes the possibility of the turf monopolizing too great a share of water administered by other means, and is valuable on a narrow parking. In cities, street trees require especial attention because of the proximity of the paved street and sidewalks which obstruct the passage of water. Tiles are not too efficient, and flooding or soaking is preferable.

Shrub and flower borders and lawns can be thoroughly watered with "soil-soakers" and sprinklers if applications are continued long enough and the water is applied slowly.

Cultivation. Economical watering of shrub and flower beds is aided by proper cultivation of the surface. The water can

soak into the broken surface much more rapidly and there is less chance of run-off. Cultivation, after the surface dries will eliminate weeds and put the soil in condition to absorb water. The elimination of unsightly weeds which compete with the ornamentals for moisture, light, and food is, of course, also beneficial and is the most important reason for cultivation.

After shrubs and flowers are established costly cultivation may be replaced by mulches, which, together with the shade provided by the plants, discourages weeds and conserves moisture. Mother Nature has used such a culture for centuries in the woods. Mulches may be of leaves, straw, peatmoss, cotton-seed hulls, or other similar organic material. Mulches should be checked occasionally to see that they are not packing and that sufficient water is getting into the soil.

Fertilization. This is not of major importance if the soil problems of the home grounds were properly considered in the beginning; if trash were removed; if grading were well done; if the topsoil were built up prior to its return as the finished grade material; and if extra depth of topsoil were supplied to those areas where trees, shrubs, and flowers were to be planted. If these procedures were not carried out and the existing soil needs improving, fertilizers may be applied. Over-stimulation causes rapid growth that is weak and susceptible to various injuries and diseases, and if carried into the fall the parts will be winter-killed. Fertilization is a complicated subject, but will be dealt with only in general terms in this paper.

There are two types of fertilizers; organic and inorganic.

Organic fertilizers tend to improve the physical properties of the soil as well as provide plant food. They also distribute their benefits over a greater period of time and are less likely to "burn" plant material. Manures should not be used until well-rotted. Several inches of well-rotted manure can be worked into the topsoil. It is even better to incorporate manures into a compost and use that, especially around evergreens. Other organic materials include tankage, dried blood, fish scrap, cottonseed meal, and soybean meal. These may be applied in the following quantities and incorporated into the topsoil: Cottonseed meal, and soybean meal--one pound per twenty square feet (both contain nitrogen, and some phosphorus is found in the first); dried blood, tankage, and fish scrap--one pound per forty square feet (30) (these contain nitrogen and the last two also contain some phosphorus).

Inorganic fertilizers include, in addition to others, those commercial mineral mixtures which supply the big three of the plant food world--nitrogen, phosphorus, and potassium. Nitrogen helps stems and leaves to grow and is necessary for healthy, green color. Phosphorus helps root growth and flower production but is slow to penetrate the soil. Potassium aids generally in growth and heightens flower color. These are often combined in what is called a complete fertilizer, such as 4-10-4. This indicates the respective amounts in the following order: Nitrogen (N), 4%; available phosphoric acid (P_2O_5) 10%; water soluble potash (K_2O) 4%. Such a fertilizer may be applied at a rate of approximately one pound per twenty-five square feet.

Care should be used to insure that it is put on the ground--not on the plants. It is then worked well into the topsoil. Of these three fertilizers, nitrogen and phosphorus are the most important in Kansas. Additional potassium is not generally needed throughout the state except in the southeast.

Specific fertilizers are available to supply only nitrogen, phosphorus, or potassium, according to soil requirements. Nitrogen can be obtained from ammonium sulfate, sodium nitrate, ammonium nitrate, and calcium nitrate; phosphorus from rock phosphate and superphosphate; and potassium from muriate of potash or sulfate of potash. Certain soils in Kansas are lacking in available iron. This brings about a chlorotic condition and the leaves of plants turn a sickly pale yellow. Applications of iron sulfate in the soil about the roots of such plants are beneficial.

Composting is a very useful method of obtaining fertile soil. A compost pile (Plate XXV, Fig. 2) is built of alternate six-inch layers of soil, manure, and leaves (straw, grass clippings, and similar organic matter may be used) to a height of about four feet. Each layer is tramped and the top is left slightly dished to catch and absorb moisture. Sixty pounds of ammonium sulfate, or equivalent, to each ton of compost will aid the process of breaking down the various materials. Some moisture may have to be added. The pile should be turned and mixed about every six months until it becomes friable and of uniform texture. This makes an excellent top dressing for shrubs and flower beds, and if screened it may be used on lawns.

If possible, it is also beneficial to compost the topsoil which was stripped off during grading operations.

Trimming. Light cutting back of small growth is usually thought of as trimming, while cutting off of large branches falls into the classification of pruning. Hedges and formal evergreens are trimmed several times a year. A hedge starts as a group of small plants placed close together. These should be cut back to six inches to induce branching at the base. As the hedge grows, trimming should be frequent to insure many branches and thick growth, yet not carried to the point where too many leaves are removed and the plants die. As the hedge takes shape its form should be always as wide, or wider, at the bottom as it is at the top, regardless of whether the hedge is rounding or flat on top. This is necessary to allow sufficient light for the lower leaves, which will otherwise drop, leaving the hedge bare at the bottom. Old hedges which have gotten "leggy" are often best rejuvenated by cutting back to six inch stubs. Since they still have a large root system it will not take too long for them to produce considerable top growth. This trimming should be done during the dormant period.

Evergreen hedges and formal trees (redcedar, for example) should be trimmed in the spring before growth starts and again about mid-summer. In each case new growth will soon cover the cut ends of the branches. Vigorous plants will require trimming at more frequent intervals.

Pruning. Except for emergency pruning it is best to prune when plants are dormant, before sap flows and growth starts in

the spring. Trees require some attention to pruning from the time they are planted, throughout their lifetime. At planting time, as previously mentioned, the tops are pruned to compensate for the root pruning attendant to transplanting, and a central leader is selected as are the first scaffold branches (Plate XXIV, Fig. 2). These latter branches will form the beginning of the framework of the tree, and should be well-spaced about the trunk, radially as well as vertically. Small branches along the base of the trunk should be left for a year or two to shade the trunk until the scaffold branches extend far enough to do so. This will eliminate sunscald. If no such branches are present, it may be necessary to wrap the bare trunk with a heavy, prepared paper or burlap, from the ground to the first branches. This also discourages insects which may attack the trunk.

In older trees, limbs are cut out if diseased, dead, broken, or if they are rubbing, or forming bad crotches and double leaders. They should always be cut without leaving stubs to allow natural healing to take place as rapidly as possible. A limb should be under-cut to prevent stripping and then cut off, leaving a safety stub which is then cut off flush with the trunk (Plate XXVI, Fig. 1 & 2).

Shrubs are also pruned when transplanted to balance tops and roots. Diseased, dead, injured, or wayward branches are removed from established plants to improve them. Shrubs are also pruned to keep them at a desirable size or to maintain a given shape. Pruning affects the flowering of shrubs and a

EXPLANATION OF PLATE XXVI

- Fig. 1. Sequence of cuts to properly remove a large limb.
- Fig. 2. Sequence of cuts to correct a weak crotch.
- Fig. 3. Improperly pruned shrub.
- Fig. 4. Shrub before pruning.
- Fig. 5. Shrub after proper pruning.



Fig. 1



Fig. 2



Fig. 3

Fig. 4

Fig. 5

proper understanding of their growth and flowering habit is essential to intelligent pruning. One group of shrubs produces flowers in the spring on wood grown the previous year. These should be pruned about a week after they are through flowering. Another group bears flowers in the summer on wood which is grown in the spring. Shrubs in this group should be pruned during the dormant season. Many people prune shrubs improperly and the chief offender is the fellow who cuts off all the lower branches on such shrubs as Van Houtte Spirea leaving them bare and leggy with a little tuft of foliage on top.

Stoloniferous shrubs which send up many shoots from about the crown soon become a dense mat of branches unless thinned by entirely removing older branches each year.

Shrubs whose growth is more vigorous than anticipated may need a judicious heading back (Plate XIVI, Fig. 3, 4, & 5). This does not mean shearing everything off at a given height but rather a cutting back of some old branches to where new shoots are starting and a thinning out of others, leaving a natural outline.

As mentioned previously in connection with old hedge plants, it is sometimes best to cut old leggy shrubs back to the ground.

Roses may be grouped roughly into four classes for pruning; shrub roses, climbers, ramblers, and the Hybrid Tea group.

Shrub roses are pruned after flowering by removing diseased, dead, and injured canes. On occasion, entire old canes can be thinned out.

Climbers require the removal of all old wood which may be

diseased or insect infested. Side shoots on the scaffold canes are shortened, and weak branches removed.

The small, flowered ramblers should be pruned right after flowering. Stems two years old or older should be removed. Branches with old flowers should be cut back to a new shoot.

Hybrid Teas, when uncovered in the spring, need to have all dead and diseased wood removed. This may mean cutting back practically to the ground. Many good rose growers cut their plants back to three to eight inch stems, as such plants will produce finer flowers. Make all cuts just above a bud or "eye" which points in the direction it is intended that the major branch should grow.

PLANT MATERIAL LISTS

These lists have been prepared to describe recommended plants of various types, to indicate their use in the landscape design, to point out their interesting features, and to give a general indication as to where in Kansas they may be expected to grow, if given reasonable care. To facilitate this matter the state of Kansas has been arbitrarily divided into six zones (Plate XXVII). This division is very general and does not mean that a certain plant will grow on one side of the line and not on the other, but rather that certain factors discourage its growth in the general area beyond that line. These divisions are the result of the incorporation of data (8, 9, 12, & 42) pertaining to various factors influencing plant growth into a composite picture. Such data included: (1) average annual precipitation, (2) average January temperatures, (3) soil classifications, and (4) observations of plant growth. In this connection the author made a tour of the state including all of the six regions, observing distribution and vigor of ornamental plant material, and contacting commercial nurserymen for their recommendations of plant material within their regions.

These lists are not intended to include all of the landscape plants useable in Kansas. However, there are enough plants listed to allow anyone a good selection in his planting plan.

All plant names used are as recommended by Standardized Plant Names (20). Those names enclosed in parenthesis are not so recommended, nor are the horticultural varieties of roses.

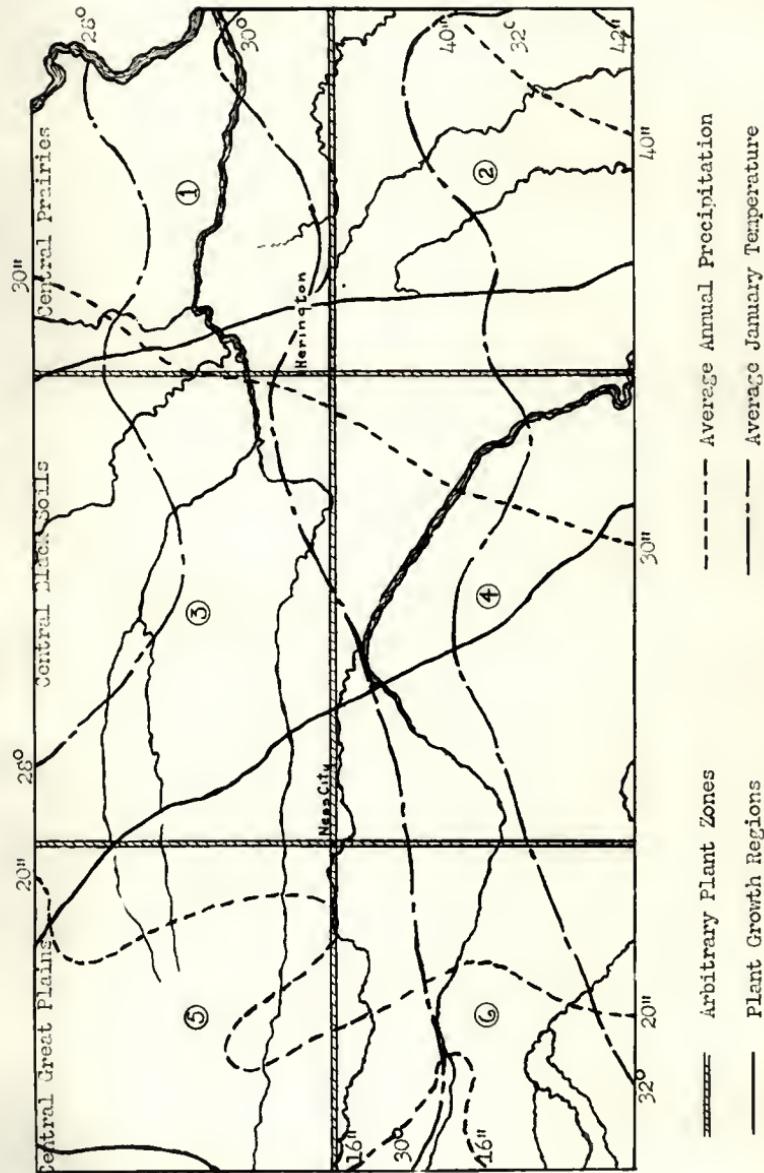
Certain abbreviations have been used in order to keep the tables from being too cumbersome, yet contain a maximum of information.

EXPLANATION OF PLATE XXVII

Kansas plant zones. To facilitate the indication of where various plants may be used, the state was divided into six plant zones, numbered from east to west. This follows the direction of diminishing rainfall.

PLATE XXVII

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Abbreviations found in Plant Lists

WL - plants recommended by Standardized Plant Names as suitable for wildlife planting

* - plants native to Kansas

HV - horticultural varieties of plants

* - plants whose flowers are inconspicuous

Use

A - autumn color	Gr - ground cover
Ac - accent	H - hedge
B - shrub or perennial border	M - mass plantings, large groups
Ba - banks, to cover and hold slopes	N - naturalistic plantings
Be - bedding effect--as a rose bed	P - pot plant
Br - barrier	R - rock garden
C - cut flowers	Sc - screen for unsightly views
E - edging of flower beds	Sh - shade tree
F - foundation planting	St - street tree
Fa - "facer" in front of taller shrubs	T - trellis
Fl - attractive flowers	V - vine
Fo - attractive foliage	W - windbreak
G - plant in groups	Wa - capable of holding on to a wall
Fr - colorful fruit	

Exposure

- s - the plants may be expected to grow well in full sunlight
- sh - the plants may be expected to grow well in the shade--exclusive of other factors such as shallow feeder roots of trees.
- p/sh - plants may be expected to grow well in partial shade, where they receive full sunlight a part of the day, or some sunlight through the trees overhead.

Soil

- a/g - any good soil. The plant is not too exacting in its soil requirements and will grow in most soils.
- r - prefers a good, deep, rich soil
- d - prefers a dry soil
- we - prefers a wet soil
- m - prefers a moist soil
- p/m - prefers a partially moist soil
- w/dr - prefers a well drained soil

Note: A duplicate key will be found at the end of the tables (Page 158). This can be unfolded and will serve as a handy reference while using the tables.

Table 1. Coniferous evergreen trees and shrubs.

Botanical Name	Common Name	Height	Use	Zone	Shape	Color Foliation	Remarks
WL 1 : <i>Abies concolor</i>	White Fir	20-30'	AC	1	pyramidal	bluish green	
2 : <i>Juniperus chinensis</i>	Pyramidal Chinese Juniper	15-20'	BR F G H Sc	all	pyramidal	gray green	protect from hot, southwest wind
3 : <i>J. c. HV</i>	Fifitzer	4-6'	Ba F Fa G	all	spreading	dark green	coarse, prickly foliage; may turn brown
4 : <i>J. horizontalis</i> douglasii	Waukegan Creeping Juniper	2-12"	A Ba F Fa Gr	1,2,3,4	creeping	steel blue	the best of its type; max. spread to 10'
5 : <i>J. h. plumosa</i>	Andorra Creeping Juniper	6-15"	Ba F Fa Gr R	1,2,3,4	creeping	silver green	fine on slopes and in rock gardens
6 : <i>J. sabina</i>	Savin Juniper	4-6'	F Fa G	all	spreading	dark green	purple in fall; silver-green in summer
7 : <i>J. s. HV</i>	Tamarix Savin Juniper	3-4'	F Fa G R	1,2,3,4	spreading	bright green	subject to blight; best HV—Von Shrou
WL 8 : <i>J. scopulorum</i>	Rocky Mountain Juniper	15-20'	Ac F G Sc W	all	pyramidal	gray green	foliage dies back occasionally; prickly
9 : <i>J. s. HV</i>	Chandler Blue	15-20'	Ac F G	all	pyramidal	silvery green	one of the best; prune to desired size
10 : <i>J. s. HV</i> (Hill Silver)		15-20'	Ac F G	all	pyramidal	silvery green	prune to desired size
11 : <i>J. squamata meyeri</i>	Meyer Singleseed Juniper	4-6'	A Ac R	1,2,3,4	irregular	bright blue	unusual shape and color; use sparingly
WL 12 : <i>J. virginiana</i>	Eastern Redcedar	30-40'	F G H N Sc W	all	pyramidal	green	trim often in foundation plantings
13 : <i>J. v. HV</i>	Cannart Redcedar	30-40'	Ac F G	all	pyramidal	dark green	trim often in foundation plantings; soft; bushy
14 : <i>J. v. HV</i>	Goldtip Redcedar	15-20'	G Sc	all	irregular	gold & green	unusual shape and color; use sparingly
15 : <i>J. v. HV</i>	Silver Redcedar	15-20'	Ac F G	all	pyramidal	silvery blue	trim every year; use sparingly
16 : <i>J. v. HV</i>	Koster Redcedar	4-6'	Ba Fa G	all	spreading	green	open in growth; long, horizontal branches
17 : <i>Picea abies</i>	Norway Spruce	40-60'	G W	1,3	pyramidal	dark green	protect from hot SW wind; drooping branchlets
WL 18 : <i>P. glauca</i>	White Spruce	30-40'	Ac G	1,3	pyramidal	blue green	protect from hot southwest wind
19 : <i>P. g. albertiana</i>	Alberta White Spruce	25-40'	Ac F G	1,2,2,3,4,5	pyramidal	blue green	dense; slow in growth; needs protection
WL 20 : <i>P. pungens</i>	Colorado Spruce	40-50'	G	1,3,4,5	pyramidal	blue green	protect from SW wind; best adapted spruce
21 : <i>P. p. HV</i>	Blue Colorado Spruce	40-50'	Ac G	1,3,4,5	pyramidal	silvery blue	protect from hot southwest wind
22 : <i>Pinus strobus</i>	High Swiss Pine	3-10'	Ac F H	1,2,2,3,4,5	globe	bright green	pinch growth tips to maintain dwarf growth
WL 23 : <i>P. nigra</i>	Austrian Pine	40-60'	G Sc W	all	upright	dark green	has been grown many years in Kansas
WL 24 : <i>P. ponderosa</i>	Ponderosa Pine	40-60'	G W	all	upright	dark green	long needles; coarse texture; good for Kansas
WL 25 : <i>P. strobus</i>	Eastern White Pine	50-70'	G Fo	1,2,3	upright	dark green	fine texture; protect from south wind
26 : <i>P. sylvestris</i>	Scotch Pine	40-50'	G W	all	upright	bluish green	twisted needles; reddish brown bark
WL 27 : <i>Pseudotsuga</i> tarifolia	Common Douglasfir	50-60'	G W	1,2	upright	green	
28 : <i>Thuja orientalis</i>	Oriental Arborvitae	20-35'	P H Sc W	1 to 4, 6	conical	yellow green	protect from hot SW wind; stand in shade
29 : <i>T. o. HV</i>	Borczimanns	4-5'	Ac F	2,4,6	conical	golden yellow	do not plant in shade; flat foliage
30 : <i>T. o. HV</i>	Excelsa	6-10'	Ac F	2,4,6	conical	bright green	do not plant in shade; use sparingly
							one of the better arborvitae

Soil: Most of the coniferous evergreens prefer a fairly good, well-drained soil.

Exposure: Most of the coniferous evergreens prefer full sunlight for best development. Numbers 1, 2, 3, 6, 12, 13, & 22 will also grow in partial shade.

Table 2. Broadleaf evergreen shrubs.

Botanical Name	Common Name	Height	Use	Soil	Zone	Exposure	Color Bloom	Month Bloom	Remarks
1 : <i>Euonymus</i> <i>kaletschovicus</i>	Spreading Euonymus	: 4-8'	: B F Fr H	: a/g	: 1 to 5	: sun,p/sh	: grn/wh	: Aug-Sep	: broad shrub; glossy, green leaves
WL 2 : <i>Mahonia aquifolium</i>	Oregongrape	: 3-6'	: A B F Fl Fo	: a/g	: 1 to 4,6	: sh,p/sh	: yellow	: Mar-Apr	: holly-like leaves; blue berries
WL 3 : <i>M. repens</i>	Creeping Mahonia	: 10"	: Ba Fa Gr R	: a/g	: 1 to 4,6	: sh,p/sh	: yellow	: Apr-May	: similar to above; dwarf
4 : <i>Pyracantha coccinea</i> <i>lalandi</i>	Laland Firethorn	: 7-10'	: B Br F Fl Fr	: w/dr	: 1,2,3,4	: 'sun	: white	: May-Jun	: orange fruit; loose growth; thorny
5 : <i>Viburnum</i> <i>rhodophyllum</i>	Leatherleaf Viburnum	: 8-12'	: B F Fo	: a/g	: 1,2	: sun,p/sh	: yel/wh	: May-Jun	: merits further trials in Kansas
6 : <i>Yucca filamentosa</i>	Adam'sneedle Yucca	: 2'	: Fl Fo R	: w/dr	: all	: sun	: white	: Jun	: good with Spanish style houses

Note: Numbers 1 & 4 are only semi-evergreens.

Table 3. Evergreen vines.

Botanical Name	Common Name	Height	Use	Soil	Zone	Exposure	Color Bloom	Month Bloom	Remarks
1 : <i>Euonymus fortunei</i> <i>radicans</i>	Common Wintercreeper <i>Euonymus</i>	: 10-25'	: Ba Gr T Wa	: a/g	: 1,2,3,4	: sh	: grn/wh	: Jul-Aug	: climbs by aerial rootlets
2 : <i>Hedera helix</i>	English Ivy	: 10-20'	: Ba Gr Wa	: w/r	: 1,2,3,4	: sh	: -	: Sep-Oct	: climbs by aerial rootlets
3 : <i>Lonicera heckrottii</i>	Everblooming Honeysuckle	: 3-8'	: B Ba F Fl T	: a/g	: 1,2,3,4	: sun,p/sh	: flame red	: May-Sep	: HV's are best; will grow as shrub
WL 4 : <i>L. japonica</i>	Japanese Honeysuckle	: 15'	: Ba Gr T	: a/g	: all	: sun,sh	: white	: Jun-Sep	: clamberer; may freeze to ground
5 : <i>Vinca minor</i>	Common Periwinkle	: 5"	: Gr	: m	: 1,2,3,4	: sh,p/sh	: blue	: Mar-Sep	: best ground cover in the shade

Note: Numbers 3 & 4 are only semi-evergreen.

Table 4. Deciduous trees.

Botanical Name	Common Name	Height	Use
1 : <i>Acer platanoides</i>	Norway Maple	40-60'	A Sh St
*2 : <i>A. saccharinum</i>	Silver Maple	60-80'	Sh St
*3 : <i>A. saccharum</i>	Sugar Maple	40-60'	A Sh St
4 : <i>A. tataricum</i>	Tatarian Maple	15-30'	A B G
*5 : <i>Aesculus arguta</i>	Texas Buckeye	4-12'	B Fl G N
*6 : <i>A. glabra</i>	Ohio Buckeye	20-30'	A Fl N
7 : <i>Ailanthus altissima</i>	Treeofheaven <i>Ailanthus</i>	40-50'	Sh
*8 : <i>Amelanchier canadensis</i>	Shadblow Serviceberry	20-30'	B Fl Fr G N
*9 : <i>Betula nigra</i>	River Birch	40-60'	A G N
*10 : <i>Bucelia laruginosa</i>	Woollybucket <i>Bumelia</i>	20-40'	A Br N
*11 : <i>Carya illinoensis</i>	Pecan	50-60'	Fr N Sh
*12 : <i>C. laciniosa</i>	Shellbark Hickory	50-70'	Fr N Sh
13 : <i>Catalpa speciosa</i>	Northern Catalpa	30-40'	Fl W
*14 : <i>Celtis laevigata</i>	Sugar Hackberry	30-50'	Fr G N Sh
*15 : <i>C. occidentalis</i>	Common Hackberry	40-50'	G N Sh St W
*16 : <i>Cercis canadensis</i>	Eastern Redbud	10-20'	B Fl G N R
17 : <i>Cladrastis lutea</i>	American Yellowwood	30-40'	A Fl G N
*18 : <i>Cornus florida</i>	Flowering Dogwood	15-30'	A B Fl Fr N
*19 : <i>Crataegus crusgalli</i>	Cockspur Hawthorn	25-30'	A Fl Fr G H
*20 : <i>C. mollis</i>	Downy Hawthorn	25-30'	A Fl Fr G N
*21 : <i>Diospyros virginiana</i>	Common Persimmon	25-40'	A Fr N
*22 : <i>Elaeagnus angustifolia</i>	Russianolive	20-30'	B Fl R Sc N
*23 : <i>Fraxinus pennsylvanica</i> lanceolata			
24 : <i>Ginkgo biloba</i>	Green Ash	40-60'	G N Sh St W
*25 : <i>Gleditsia triacanthos</i>	Ginkgo	40-50'	A Sh
*26 : <i>G. t.</i> HV	Common Honeylocust	40-50'	A Br N Sh W
*27 : <i>Cynometra dioicus</i>	Thornless Honeylocust	40-50'	A N Sh W
*28 : <i>Juglans cinerea</i>	Kentucky Coffeetree	40-50'	G N Sh
*29 : <i>J. nigra</i>	Butternut	40-60'	A Fr N Sh
30 : <i>Koelreuteria paniculata</i>	Eastern Black Walnut	50-80'	A Fr N Sh
31 : <i>Liquidambar styraciflua</i>	Paniced Goldraintree	20-30'	B Fl Sc
32 : <i>Liriodendron tulipifera</i>	American Sweetgum	30-50'	A N Sh
*33 : <i>Maclura pomifera</i>	Tuliptree	50-60'	A Fl Sh
34 : <i>Magnolia soulangiana</i>	Osageorange	20-30'	Br H W
*35 : <i>Malus ioensis</i>	Saucer Magnolia	12-18'	Fl
36 : <i>M. baccata</i> X <i>M. pumila</i> N	Prairie Crabapple	20'	Fl Fr G N R
37 : <i>Morus alba tatarica</i>	(Nopu Crab)	25'	B Fl Fr
*38 : <i>M. rubra</i>	Russian Mulberry	30'	H Sh W
*39 : <i>Ostrya virginiana</i>	Red Mulberry	30'	N Sh
40 : <i>Platanus acerifolia</i>	American Hopornbeam	25'	G N
*41 : <i>P. occidentalis</i>	London Planetree	50-70'	Sh St
	(Sycamore)	70-80'	Sh St N
42 : <i>Populus alba</i>	White Poplar	50-60'	Sh
43 : <i>P. a.</i> HV	Bolleana	50-60'	Ac Sc G
*44 : <i>P. deltoides</i>	(Cottonwood)	65-100'	A N Sh W
45 : <i>P. nigra</i>	Leopardy	50-80'	Ac Sc W
*46 : <i>Prunus americana</i>	American Plum	20-30'	Fl Fr G N
47 : <i>P. cerasifera</i> divaricata HV	Pissard		
	(Purpleleaf Plum)	10-15'	Fl Fr

Soil	Zone	Exposure	Color	Foliation	Shape	Remarks
w/dr: 1,2	: sun, p/sh	: dk/grn	broad			: fine in E. Kan.; subject to sunscald
/m : all	: sun, p/sh	: lt/grn	broad			: branches break easily
r : 1	: sun, p/sh	: green	oval			: good fall color; subject to sunscald
r : 1,2,3,4:	: sun, p/sh	: green	shrubby			: use as small tree or large shrub
r : 1,2,3,4:	: sun, p/sh	: lt/grn	shrubby			: flowers are yellow in open panicles
cor : 1,2,3	: sun, p/sh	: yel/grn	oval			: fruits are prickly brown capsules
cor : all	: sun	: green	tall			: coarse; use only as last resort
/g : 1,2	: shade	: green	narrow			: edible fruit; white flowers
/g : 1,2	: p/sh	: green	slender			: streambanks; papery brown bark
/g : 1to,6	: sun, sh	: green	irregular			: spiny; usually shrubby and dense
: 1,2,4	: sun	: green	tall			: edible nuts; plant in river bottoms
: 1,2	: sun	: green	tall			: coarse texture; edible nuts
: all	: sun	: green	broad			: good for post plantations; coarse
/g : 1,2,4	: sun, p/sh	: lt/grn	round			: red berries in fall; edible
/g : all	: sun	: lt/grn	round			: purple berries; edible; good tree
/g : all	: sun, p/sh	: dk/grn	flat, bushy			: rosy pink flowers before leaves
/g : 1,2	: sun, p/sh	: lt/grn	round top			: sparse branching; may sun-scald
/dr : 1,2,3,4:	: sun	: green	bushy			: pink or white "flowers" in May; protect
/dr : 1,2,3,4:	: sun	: dk/grn	bushy			: thorny; white flowers in May; red fruit
/g : 1,2,3,4:	: sun	: dk/grn	round			: thorny; white flowers; scarlet fruit
/g : all	: sun	: silvery	irregular			: edible fruit; rather dirty tree
						: drought resistant; plant sparingly
/g : all	: sun	: green	irregular			: used over practically all of Kansas
/g : 1,2	: sun, p/sh	: yel/grn	pyramidal			: unusual tree; subject to sun-scald
/g : all	: sun	: dk/grn	broad			: thorny; drought resistant
/g : all	: sun	: dk/grn	broad			: thorny; drought resistant
/g : 1,2,3,4:	: sun	: gray/grn	round			: coarse branches; large fruit pods
/g : 1,2	: sun, p/sh	: yel/grn	broad			: edible nuts
/g : 1,2,3,4:	: sun, p/sh	: yel/grn	broad			: edible nuts; plant in river bottoms
/g : 1,2,3,4:	: sun, p/sh	: lt/grn	round			: golden flowers in June; sun scalds
/m : 1,2,4	: sun, p/sh	: shiny/grn	pyramidal			: likes lowland; possible winter injury
/m : 1,2	: sun	: dk/grn	broad			: interesting foliage and flowers
/g : 1to,6	: sun	: dk/grn	round			: hedges
/g : 1,2	: sun	: dk/grn	round			: one of hardiest magnolias
/dr : 1,2,3,4:	: sun	: dk/grn	round			: pink flowers; subject to cedar-apple rust
/g : all	: sun	: dk/grn	upright			: large pink flowers in April; red fruit
/g : all	: sun	: lt/grn	round			: sweet, violet fruits attract birds
/g : 1,2,3,4:	: p/sh	: green	round top			: use in wild plantings
/g : 1,2	: shade	: dull/grn	open			: use in wild plantings
/g : 1,2,3,4:	: sun	: lt/grn	round			: tolerant of smoke and gas
/g : 1,2,3,4:	: sun, p/sh	: lt/grn	broad			: white bark; brown, round seed-balls
/g : 1,2,3,4:	: sun	: grn/wht	irregular			: leaves white underneath; suckers badly
/g : all	: sun	: grn/wht	columnar			: shortlived; use sparingly; light bark
/g : all	: sun	: shiny/grn	open			: "State tree of Kansas"
/g : 1,2,3,4:	: sun	: shiny/grn	columnar			: short lived
/g : 1 to 5	: sun	: dk/grn	irregular			: grows naturally in groups
/g : 1,2,3,4:	: sun, p/sh	: prp, red	upright			: use sparingly; wine red fruits

Table 4 (concl.)

Botanical Name	Common Name	Height	Use
*WL 48 : <i>P. serotina</i>	: Blackcherry	: 30-50'	: Fl Fr N
*WL 49 : <i>P. virginiana</i>	: Common Chokecherry	: 15-25'	: Fl Fr N
50 : <i>Ptelea trifoliata</i>	: Common Hopetree	: 15-20'	: B N
*WL 51 : <i>Quercus alba</i>	: White Oak	: 50-80'	: A N Sh St
*WL 52 : <i>Q. borealis maxima</i>	: Eastern Red Oak	: 60-80'	: A sh St
* 53 : <i>Q. imbricaria</i>	: Shingle Oak	: 60-70'	: A N Sh St
* 54 : <i>Q. macrocarpa</i>	: Bur Oak	: 50-80'	: G N Sh
* 55 : <i>Q. muehlenbergii</i>	: Chinkapin Oak	: 35-50'	: A N Sh R
*WL 56 : <i>Q. palustris</i>	: Pin Oak	: 50-60'	: A N Sh St
WL 57 : <i>Robinia pseudoacacia</i>	: Black Locust	: 35-40'	: Fl Sh W
58 : <i>Salix babylonica</i>	: Babylon Weeping Willow	: 40-50'	: Sh
*WL 59 : <i>S. nigra</i>	: Black Willow	: 40'	: Ba N
*WL 60 : <i>Sapindus drummondii</i>	: Western Soapberry	: 25-30'	: Fr G N
61 : <i>Sophora japonica</i>	: Japanese Pagodatree	: 50-60'	: Fl Sh
62 : <i>Sorbus aucuparia</i>	: European Mountainash	: 20-30'	: Fl Fr
WL 63 : <i>Taxodium distichum</i>	: Common Baldcypress	: 50-70'	: A N
*WL 64 : <i>Tilia americana</i>	: American Linden	: 40-60'	: A N Sh St
*WL 65 : <i>Ulmus americana</i>	: American Elm	: 50-70'	: N Sh St W
* 66 : <i>U. fulva</i>	: Slippery Elm	: 40-50'	: N Sh St
67 : <i>U. parvifolia</i>	: Chinese Elm	: 35-45'	: G Sh W
68 : <i>U. pumila</i>	: Siberian Elm	: 50-60'	: G H Sh W
* 69 : <i>U. thomasi</i>	: Rock Elm	: 40-50'	: G N Sh

Table 5. Deciduous shrubs.

Botanical Name	Common Name	Height	Use
1 : <i>Abelia grandiflora</i>	: Glossy Abelia	: 3- 5'	: A B F Fl G
2 : <i>Acanthopanax sieboldianus</i>	: (Fiveleaf Aralia)	: 5- 7'	: B Br F Sc
*WL 3 : <i>Amorpha canescens</i>	: Leadplant Amorpha	: 1- 2'	: Fl N R
*WL 4 : <i>A. fruticosa</i>	: Indigobush Amorpha	: 5-10'	: B Fl G N Sc
5 : <i>Berberis mentorensis</i>	: Mentor Barberry	: 4- 5'	: B Br F Fr H
WL 6 : <i>B. thunbergii</i>	: Japanese Barberry	: 3- 4'	: B Br F Fa Fr
7 : <i>B. t. HV</i>	: Truehedge Columberry	: 3- 4'	: B Br F Fr H
8 : <i>Buddleia davidi</i>	: Orangeeye		
	: Butterflybush	: 3- 8'	: B Fl G
9 : <i>Callicarpa dichotoma</i>	: Purple Beautyberry	: 3- 5'	: B Fl
10 : <i>Calycanthus floridus</i>	: Common Sweetshrub	: 5- 7'	: B F Fl
11 : <i>Caragana arborescens</i>	: Siberian Peashrub	: 6-10'	: B F Fl Sc W
*WL 12 : <i>Ceanothus americanus</i>	: Jerseytea Ceanothus	: 2- 3'	: B Fa Fl N

Soil	Zone	Exposure	Color Foliage	Shape	Remarks
/g	: 1,2	: sun, p/sh	: shiny/grn	: oblong	: use in wild plantings; dark fruit
/g	: 1,2,3,4:	: sun, p/sh	: shiny/grn	: rounded	: P.v.demissa good for West Kansas
/g	: 1,2,3,4:	: sun, p/sh	: green	: open	: shrubby
/g	: 1,2	: sun	: grn	: broad	: a very desirable tree
/g	: 1,2	: sun	: dk/grn	: rounded	: an excellent shade tree
/g	: 1,2,3,4:	: sun	: dk/grn	: rounded	: smooth, oblong leaves
/g	: 1,2,3,4:	: sun	: dk/grn	: broad	: large, rugged tree
/g	: 1,2,3,4:	: sun	: yel/grn	: irregular	: limestone soil
/dr	: all	: sun	: shiny/grn	: pyramidal	: one of finest ornamental oaks
/dr	: all	: sun	: dk/grn	: oblong	: short lived; subject to borer attack
	: 1,2,3,4:	: sun	: lt/grn	: broad	: use sparingly by water only; drooping
/g	: 1 to 4,6:	: sun, p/sh	: green	: broad, open	: erosion control on stream banks
/g	: 1,2,4,6:	: sun	: lt/grn	: rounded	: interesting yellow berries all winter
	: 1,2,3:	: sun, p/sh	: dk/grn	: rounded	: brought from Orient; green stems
/g	: 1,2	: p/sh, sh	: dk/grn	: pyramidal	: bright red fruit in late summer
et	: 1,2,3,4:	: sun, p/sh	: dk/grn	: pyramidal	: fine texture; will grow on upland
	: 1,2,3,4:	: sun, p/sh	: dull/grn:	: ovoid	: good shade tree
/g	: all	: sun	: dk/grn	: vase	: old standby; a most useful tree
/g	: 1 to 5	: sun	: dk/grn	: broad	: buds rusty, hairy
ry	: all	: sun	: dk/grn	: shrubby	: slow growth; twiggy; small leaves
ry	: all	: sun	: lt/grn	: upright	: erroneously called "Chiness Elm"
/dr	: all	: sun	: dk/grn	: narrow	: branches to the ground

Soil	Zone	Exposure	Color Bloom	Month Bloom	Remarks
/g	: 2,4	: sh, sun	: pksh/wh	: May-Jun	: almost evergreen; winter kills
/g	: 1,2,3,4:	: sun, p/sh	: x	: Jun-Jul	: thorny; light green
/g	: all	: sun	: blue	: May-Jun	: is an unusual silvery color
/g	: all	: sun	: purp/bl	: Apr-May	: rather "leggy"; needs facer
/g	: all	: sun, p/sh	: yellow	: Apr	: patented plant; holds leaves late
/g	: 1,2,3,4:	: p/sh	: yellow	: Apr	: fine texture; red berries
/g	: 1,2,3,4:	: p/sh	: yellow	: Apr	: upright stems; fine texture
/g	: 1,2,3,4:	: sun	: lilac	: Jul-Oct	: many hort varieties; dies back
/g	: 1,2,4	: sun	: pink	: Aug	: purple berries; dies back
/g	: 1,2,4	: p/sh	: red/brn	: Apr-May	: unusual flowers; large leaves
/dr	: all	: sun	: yellow	: Apr-May	: light green foliage; needs facer
/dr	: all	: sun	: white	: Apr-Jun	: dwarf; slow growing

Table 5 (cont.)

Botanical Name	Common Name	Height	Use
WL 13 : <i>Cephaelanthus occidentalis</i>	Common Buttonbush	5-10'	B Fl G H Sc :
14 : <i>Chaenomeles lagenaria</i>	Common Floweringquince	4-6'	B Br F Fl :
15 : <i>C. japonica</i>	Japanese		
16 : <i>Colutea arborescens</i>	Floweringquince	2-3'	B Fa Fl R :
17 : <i>Cornus mas</i>	Common Bladdernsenna	5-8'	B F Fl Sc :
	Corneliancherry		
	Dogwood	10-15'	B Fl Fr G :
WL 18 : <i>C. asperifolia</i>	Roughleaf Dogwood	5-12'	B Fl G H Sc :
WL 19 : <i>C. stolonifera</i>	Rosier Dogwood	6-8'	Ba F Fl G N :
20 : <i>Cotinus coggygria</i>	Common Smoketree	12-15'	B Fl Sc :
21 : <i>Cotoneaster acutifolia</i>	Paking cotoneaster	5-8'	B F G H :
22 : <i>Deutzia gracilis</i>	Slender Doutzia	2-3'	B F Fa Fl :
23 : <i>D. lemoinei</i>	Lemoine Doutzia	4-6'	B F Fl :
24 : <i>D. scabra</i>	Fusmy Doutzia	6-7'	B F Fl :
25 : <i>Euonymus alatus</i>	Winged Euonymus	5-7'	A B F Fr :
WL 26 : <i>E. europaeus</i>	European Euonymus	4-6'	A B Fr H :
WL 27 : <i>E. atropurpureus</i>	Eastern Wahoo	8-10'	A B Fl Fr H :
28 : <i>Erythrina racemosa</i>	Common Pearlbush	6-8'	B F Fl G :
29 : <i>Forsythia intermedia</i>	Border Forsythia	4-7'	B F Fl G :
30 : <i>F. suspensa</i>	Weeping Forsythia	5-7'	Ba F Fl G :
31 : <i>F. viridissima</i>	Greenstem Forsythia	6-8'	B F Fl G :
32 : <i>Hamamelis vernalis</i>	Vernal Witchhazel	4-6'	A B Fl G :
33 : <i>Hibiscus syriacus</i>	Shrubalthea	8-10'	B F Fl Sc :
34 : <i>Hydrangea arborescens</i>	Smooth Hydrangea	3-4'	B F Fl G :
35 : <i>H. paniculata</i>	Panicle Hydrangea	6-8'	B Fl G :
36 : <i>Hypericum frondosum</i>	Golden St.Johnswort	3-4'	B Fa F Fl :
WL 37 : <i>Ilex decidua</i>	Possurahaw	8-15'	B Fr G N Sc :
38 : <i>Kerria japonica</i>	Japanese Kerria	4-6'	B F Fl G :
39 : <i>Kolkwitzia amabilis</i>	Beautybush	6-8'	B F Fl G :
40 : <i>Lagerstroemia indica</i>	Common Crapemyrtle	2-6'	B F Fl :
WL 41 : <i>Lespedeza thunbergii</i>	Thunberg Lespedeza	3-4'	B Fa F Fl :
42 : <i>Ligustrum amurense</i>	Azur Privet	8-10'	H Sc :
43 : <i>L. obtusifolium</i>	Border Privet	5-7'	B H Sc :
44 : <i>L. o. regelianum</i>	Regels Border Privet	3-5'	B F Fl Fr H :
WL 45 : <i>L. vulgare</i>	European Privet	8-10'	B Fr H Sc H :
WL 46 : <i>Lonicera fragrantissima</i>	Winter Honeysuckle	6-8'	B F Fl H :
WL 47 : <i>L. maackii</i>	Azur Honeysuckle	8-10'	B Fl Fr G W :
WL 48 : <i>L. morrowi</i>	Morrow Honeysuckle	5-6'	B F Fl Fr G :
WL 49 : <i>L. tatarica</i>	Tatarian Honeysuckle	8-10'	B F Fl Fr G :
50 : <i>Philadelphus coronarius</i>	Sweet Mockorange	8-10'	B F Fl G :
51 : <i>P. grandiflorus</i>	Big Scentless		
52 : <i>P. virginalis</i>	Mockorange	8-10'	B F Fl G Sc :
WL 53 : <i>Physocarpus opulifolia</i>	Virginalis Mockorange	6-8'	B F Fl G :
54 : <i>P. alternans</i>	Common Ninebark	5-8'	B F Fl G :
WL 55 : <i>Prunus angustifolia</i>	Dwarf Ninebark	3-4'	B F Fa Fl G :
WL 56 : <i>P. besseyi</i>	Sand Chickasaw Plum	4-10'	Fl Fr G H W :
	Bessey Cherry	4-6'	B Fl Fr G N :

Soil	Zone	Exposure	Bloom	Bloom	Remarks
	1,2,3,4	sun,p/sh	yellow	Jun-Jul	likes stream banks; glossy foliage
s/g	all	sun,p/sh	red	Mar-Apr	early bloom; loose growth habit
s/g	1,2,3,4	sun,p/sh	orange	Mar-Apr	bears flowers inside of plant
s/dr	1,2,4	sun	yellow	May-Jun	needs facer; pealike flowers
s/g	1,2	sun,p/sh	yellow	Mar	bright red fruit in August
s/g	all	sun,p/sh	white	May-Jun	white round fruit
s/g	1,2,3,4	sh,p/sh	white	May	red branches in winter
s/g	1,2,3,4	sun,p/sh	purple	Jun-Jul	like a cloud of smoke when in bloom
w/dr	all	sun,p/sh	pinkish	May	black berries; deep green foliage
s/g	1,2	p/sh	white	Apr-May	many flowers; injured by drought
s/g	1,2,3,4	sun,p/sh	white	Apr-May	mass of flowers; best Deutzia
s/g	1,2	sun,p/sh	pk/sh	Jun-Jul	hort.var., Pride of Rochester, best
s/g	1,2,3,4	sun,p/sh	lt/yel	May-Jun	red berries; odd, corky bark
s/g	1,2	sh,p/sh	yellow/grn	Jun	attractive pink fruit in autumn
s/g	1,2,3,4	sh,p/sh	purple	May-Jun	crimson fruit in fall
m	1,2,3,4	sun,p/sh	white	Apr-May	mass of white flowers
s/g	all	sun,p/sh	yellow	Mar-Apr	profuse early bloomer
s/g	all	sun,p/sh	yellow	Mar-Apr	drooping habit
s/g	1,2,3,4	sun,p/sh	yellow	Mar-Apr	upright habit
m	1,2	sh,p/sh	yellow	Jan-Mar	interesting flowers in winter
s/g	all	sun	various	Aug-Sep	upright habit; thrifty; needs facer
m	1,2,3,4	sh,p/sh	white	Jun-Jul	flowers in large clusters
s/g	1,2,3,4	p/sh,sh	white/bl	Aug	old standard hydrangea
s/g	1,2,3,4	sun,p/sh	yellow	Jun-Jul	tops may winter-kill
s/g	1,2	sun,sh	white	May	scarlet fruit
w/dr	1,2	p/sh,sh	yellow	May	green twigs; sparse growth; dbl. H.V. best
s/g	all	sun,p/sh	pink	May	profuse bloomer
s/g	2,4	sun	pink	Jul-Sep	tops usually winter-kill; protect
s/g	1,2,3,4	sun	purple	Sep	herbaceous shrub
s/g	all	sun,p/sh	**	---	light green foliage; very hardy
s/g	all	sun,p/sh	**	---	compact
s/g	1,2,3,4	p/sh	white	May	deep green foliage
s/g	all	sun,p/sh	**	---	hardy; heavy foliage; H.V. may blight
s/g	1,2,3,4	sun,p/sh	white	Mar-Apr	half evergreen; very useful
s/g	all	sun,p/sh	white	May	bright, red berries until winter
s/g	all	sun,p/sh	white	May	red fruit; broad habit
s/g	all	sun,p/sh	pk/sh	Apr-May	most common; many varieties
s/g	1,2,3,4	p/sh	white	May-Jun	fragrant blossoms
s/g	1,2,3,4	p/sh	white	May-Jun	needs a facer
s/g	1,2,3,4	sh,p/sh	white	May-Jun	double flower; periodic bloomer
s/g	1,2,3,4	p/sh	white	May	dark green foliage
s/g	1,2,3,4	p/sh	white	Apr-May	dark green foliage; compact
s/g	all	sun	white	Apr	edible fruit
s/g	all	sun	white	Apr	spreading; purple fruit; edible

Table 5 (concl.)

Botanical Name	Common Name	Height	Use
57 : <i>P. glandulosa</i>	: Almond Cherry	: 3-5'	: B F F1 :
58 : <i>P. tomentosa</i>	: Manchu Cherry	: 4-8'	: B F F1 Fr G :
WL 59 : <i>Rhamnus cathartica</i>	: Common Buckthorn	: 10-14'	: B C H Sc :
60 : <i>Rhodotypos scandens</i>	: Black Jetbead	: 4-5'	: B Fa F1 G :
*WL 61 : <i>Rhus aromatica</i>	: Fragrant Sumac	: 3-6'	: A B F1 H R :
*WL 62 : <i>R. copallina</i>	: Flavescent Sumac	: 8-15'	: A B G N Sc :
*WL 63 : <i>R. glabra</i>	: Smooth Sumac	: 8-12'	: A B G N Sc :
WL 64 : <i>R. typhina</i>	: Staghorn Sumac	: 10-30'	: A G N :
WL 65 : <i>Ribes aureum</i>	: Golden Currant	: 4-6'	: B F1 Fr :
* 66 : <i>R. missouriense</i>	: Missouri Gooseberry	: 4-6'	: B Fr F1 Fr :
67 : <i>R. odoratum</i>	: Clove Currant	: 4-8'	: B F1 Fr :
68 : <i>Robinia hispida</i>	: Roseacacia Locust	: 3-4'	: B F1 R :
*WL 69 : <i>Sambucus canadensis</i>	: American Elder	: 6-8'	: F1 Fr G N :
WL 70 : <i>Shepherdia argentea</i>	: Silver Buffaloberry	: 6-14'	: Br H Sc :
71 : <i>Spiraea arguta</i>	: Garland Spirea	: 4-5'	: B F F1 G Sc :
72 : <i>S. bumalda</i> HV	: Anthony Waterer	: 1-2'	: B F Fa F1 :
73 : <i>S. b.</i> HV	: Freezel	: 2-3'	: B F Fa F1 :
74 : <i>S. prunifolia</i>	: Bridalwreath Spirea	: 4-5'	: B F F1 :
75 : <i>S. thunbergi</i>	: Thunberg Spirea	: 3-4'	: B F Fa F1 :
76 : <i>S. trichocarpa</i>	: Korean Spirea	: 5-6'	: B F Fa F1 :
77 : <i>S. vanhouttei</i>	: Vanhoutte Spirea	: 4-6'	: B F F1 G Sc :
* 78 : <i>Staphylea trifolia</i>	: American Bladdernut	: 8-12'	: F1 G N :
WL 79 : <i>Symporicarpos albus</i>	: Common Snowberry	: 2-3'	: B F Fa F1 G :
80 : <i>S. chenaultii</i>	: Chenault Coralberry	: 2-3'	: B F Fa :
*WL 81 : <i>S. orbiculatus</i>	: Indiancurrant Coralberry	: 2-3'	: F Fa G N R :
82 : <i>Syringa chinensis</i>	: Chinese Lilac	: 6-8'	: B F F1 Sc :
83 : <i>S. persica</i>	: Persian Lilac	: 6-8'	: B F F1 H Sc :
WL 84 : <i>S. vulgaris</i>	: Common Lilac	: 8-12'	: B F F1 H Sc :
85 : <i>Tamarix hispida</i>	: Kashgar Tamarisk	: 6-12'	: B F1 H Sc N :
86 : <i>T. odessana</i>	: Odessa Tamarisk	: 6-12'	: B F1 H Sc N :
*WL 87 : <i>Viburnum lantago</i>	: Nannyberry Viburnum	: 6-12'	: B F1 H Sc N :
WL 88 : <i>V. opulus</i>	: European Cranberrybush viburnum	: 6-8'	: A B F F1 Fr :
*WL 89 : <i>V. prunifolium</i>	: Blackhaw Viburnum	: 8-12'	: B F1 Fr N :
90 : <i>V. tomentosum</i>	: Doublefile Viburnum	: 6-8'	: A B F F1 :
91 : <i>Vitis aestivalis</i>	: Lilac Chastetree	: 6-8'	: B Ba F1 Sc :
92 : <i>Weigela florida</i>	: Old fashioned Weigela	: 6-8'	: B F F1 :
*WL 93 : <i>Zanthoxylum americanum</i>	: Common Prickly Ash	: 8-10'	: N :

Note: See table 7 for roses suitable for planting as shrubs.

Soil	Zone	Exposure	Color	Bloom	Month	Bloom	Remarks
/g	1,2,3,4	sun,p/sh	pk/wh		Apr-May		hort. vars. (Double Flowering Almond)
/g	1,2,3,4	Sun,p/sh	white		Mar-Apr		edible fruit; rough foliage
/g	all	sun,p/sh	yal/grn		Apr-May		very hardy; tree-like
/g	1,2,3,4	sh,p/sh	white		Apr-May		nice foliage; black berries
/dr	all	sun,p/sh	yellow		Apr-May		very hardy; useful; red fruit
/dr	all	sun,p/sh	greenish		Jul		colorful in fall; needs facer
/dr	all	sun,p/sh	greenish		Jul		red fruit, coarse texture
/dr	1,2,3,4	sun,p/sh	greenish		Jun		branches velvety, hairy
/g	1,2,3,4	p/sh,sh	yellow		Apr		black fruit; spreads
/g	1,2,3,4	p/sh,sh	grn/wh		Apr		thorny
/g	1,2,3,4	p/sh,sh	yellow		Apr		black fruit; fragrant
/g	1,2,3,4	sun,p/sh	rose		May		large clusters of flowers
/g	all	sun,p/sh	white		Jun		fine for wild plantings
/g	all	sun	yellowish		Apr-May		silvery foliage
/g	1,2,3,4	sun,p/sh	white		Apr-May		fine foliage; mass of flowers
/g	1,2,3,4	sun,p/sh	crimson		Jun-Aug		excellent facer; good small plant
/g	1,2,3,4	sun,p/sh	pink		Jun-Aug		excellent facer; good small plant
/g	1,2,3,4	sun,p/sh	white		Apr-May		irregular growth; shiny foliage
/g	1,2,3,4	sun	white		Apr		good facer; grows in dry places
/g	all	sun	white		May-Jun		dark green foliage
/g	all	sun,p/sh	white		Apr-May		most used ornamental shrub
/g	1,2,3,4	p/sh	white		Apr		useful in wild plantings
/g	all	sun,sh	pinkish		Jun-Aug		snow-white fruit
/g	all	sun,sh	pinkish		Jul		fine textured foliage
/g	all	sun,sh	white		Jul		useful native plant; red fruit
/g	all	sun,p/sh	red/prp		Apr-May		upright habit
/g	all	sun,p/sh	lt.lilac		Apr-May		fragrant flowers
/g	all	sun,p/sh	lilac		Apr-May		hardy, fragrant flowers; many HV's
/dr	all	sun	pink		Jul-Aug		blue-green foliage
/dr	all	sun	pink		Jun-Jul		feathery foliage
/m	1,2	p/sh	white		Apr-May		blue-black fruit; upright habit
/g	1,2,3,4	sun,p/sh	white		Apr-May		scarlet fruit; "snowball"
/g	1,2	sun,p/sh	white		Apr-May		dark blue fruit; very hardy
/g	1,2,3	sun,p/sh	white		Apr-May		good HV's
/dr	1 to 5	sun	lilac		Jun-Aug		tops usually winter-kill
/g	1,2,3,4	sh,p/sh	pink		May		profuse bloomer
/g	1,2,3	sh,p/sh	grn/yel		Apr		use in wild plantings

Table 6. Perennial Vines.

Botanical Name	Common Name	Height	Use	Soil	Zone	Exposure	Color Bloom	Month Bloom	Remarks
1 : <i>Campsis radicans</i>	Common Trumpetcreeper	: 30'	: Ba Fl T	: a/g	: all	: sun,p/sh	: orange	: Jun-Jul	: vigorous growth; spreads badly
2 : <i>Celastrus scandens</i>	American Bittersweet	: 25'	: A Fl Fr T	: a/g	: 1,2,3,4	: p/sh	: grnsh/wht	: May	: crimson seed; yellow fruit
3 : <i>Clematis paniculata</i>	Sweetautumn Clematis	: 20'	: Fl Fo T	: a/g	: 1,2,3,4	: sun,p/sh	: white	: Aug-Sep	: fast growing; dense foliage; good fls.
4 : <i>C. Jackmani</i>	Jackman Clematis	: 10'	: Fl T	: a/g	: 1,2,3,4	: sun,p/sh	: purple	: Jun-Oct	: excellent bloomer, with care
5 : <i>Lycium chinense</i>	Chinese Wolfberry	: 12'	: Ba Sc	: dry	: all	: sun,p/sh	: purple	: Jun-Sep	: holds soil on poor banks; thorny
6 : <i>Lonicera sempervirens</i>	Trumpet Honeysuckle	: 15-20'	: Ba Fl T	: a/g	: all	: sun,p/sh	: scarlet	: May-Aug	: rank growth
7 : <i>Parthenocissus</i>									
	<i>quinquefolia</i>	: 40'	: A Fo N	: a/g	: all	: sh,p/sh	: *	: -----	: adhesive tendrils; good
8 : <i>P. tricuspidata</i>	(Boston Ivy)	: 50'	: A Fo W	: a/g	: all	: sh,p/sh	: *	: -----	: adhesive tendrils; good
9 : <i>Polygonum auberti</i>	Silver Vine Pleeceflower	: 15-20'	: Fl Fo T	: a/g	: all	: sun	: white	: Aug-Sep	: trailing habit; fine foliage
10 : <i>Smilax hispida</i>	Bristly Greenbrier	: 20'	: Br N	: a/g	: 1,2,3,4	: sh,p/sh	: *	: -----	: thorny; bright foliage
11 : <i>Vitis vulpina</i>	Frost Grape	: high	: Ba Fr N Sh	: moist	: 1,2,3,4	: sun,sh	: white	: Jun	: fruit edible after frost
12 : <i>Wistaria sinensis</i>	Chinese Wistaria	: 25'	: Fl Sh T	: a/g	: 1,2,3,4	: sun	: blue	: Apr-May	: rapid in growth; coarse

Table 7. Roses.

Kansas, except the extreme northwest corner, is classified by the U.S.D.A. as within the Hybrid Tea, Hardy Climber, Polyantha zone. It is recommended, however, that the Horticultural Varieties be protected during the winter by mounding soil up to about 10" around the base of each plant and covering the bed with straw held in place by wire netting. Most of these roses can be grown anywhere in Kansas, given the proper care and attention.

Soil: Most roses prefer a good loamy soil, slightly moist, but with good drainage. Here, a mulch of some sort (peatmoss) helps to conserve moisture.

Exposure: Most roses should have open sunlight most of the day, or at least half of the day, and some shelter from strong winds.

A. Rose species. This group, except *Rosa wichuriana* which is of trailing habit, may be grown as shrubs in the border. There are many hybrids of *Rosa rugosa*.

Botanical Name	Common Name	Height	Use	Zone	Color Bloom	Month Bloom	Remarks
1 : <i>Rosa rugosa</i>	Father Hugo Rose	: 6-7'	: B Br Fl Fr	: all	: yellow	: May	: single flowers; scarlet fruit
2 : <i>R. rugosa</i>	Rugosa Rose	: 5-6'	: A B Fl Fr N	: all	: wh/dk pink	: May-Sep	: very hardy; single flowers; wrinkled foliage; thorny
3 : <i>R. setigera</i>	Prairie Rose	: 5-6'	: B Br Fl M	: all	: rose	: May-Jun	: large, single flowers
4 : <i>R. wichuriana</i>	Wichura Rose	: varies	: Ba Br Fl N	: all	: white	: Jul-Sep	: a trailing type; thorny; red berries

Table 7 (cont.)

Horticultural varieties

Many of these are the result of intensive plant breeding and have lost their botanical significance. The names are not all to be found in Standardized Plant Names. This is not a complete list, but a representative one of some of the better varieties.

Hybrid Teas. The most important group of roses in America. They bloom, more or less, from early summer until frost, and are generally hardy over most of the U.S. except the Rocky Mountains and extreme north. If left alone, they will make an 18-40" bush. The Hybrid Teas listed are all varieties tested by the Pennsylvania State College School of Agriculture Experiment Station, State College, Pa. and found to be in "the best fifty utility hybrid tea roses based on flower production and cuttable stems for three flowering seasons, disregarding quality of bloom, habits of growth, and resistance to disease" (1943, 1944, 1945) except Mary Margaret McBride. This group is on the average about 30" tall, with a range of 2-4'. They are useful when grown for cut flowers alone, but more useful when grown in rose beds in a formal garden, where the flowers provide a beautiful and varied color pattern to accentuate the garden design. May and June are the two months of maximum bloom.

Red

Common Name	Remarks
1 : Ami Quinard	: a dark red rose; good growth; fragrant blooms
2 : Crimson Glory (Pat)	: a deep crimson colored rose; good growth; flowers best in June and September
3 : Dicksons Red (Pat)	: dark red, fragrant flowers bloom early; vigor is good; (All America Rose Selection)
4 : Mary Margaret McBrido (Pat)	: a clear, coral pink color; really ever-blooming; excellent growth; (All American Rose Selection)
5 : McGrody's Scarlet	: a scarlet rose of good growth; useful as a bedding rose
6 : Margaret McGredy	: color is orange vermillion; the clusters of bloom are very fragrant and appear primarily in June
7 : Red Radiance	: a clear red color; plants make excellent growth; most blossoms appear in June

White

1 : Mme Jules Boucho	: clusters of fragrant, white flowers most of season; sometimes tinted pink
2 : Neige Parfum (Pat. N.R.)	: large, very fragrant, white blossoms most of season; healthy growth
3 : Pedrables	: produces many clusters of white flowers; excellent bedding rose
4 : White Briarcliff (Pat)	: fine, white buds; vigorous growth

Pink

Common Name	Remarks
1 : Good News	: a pink rose of good growth; blooms late
2 : Lady Alice Stanley	: most pink flowers in Sept.; good growth
3 : Miss Rowena Thon	: good pink bedding type; good growth
4 : Mrs. Charles Bell	: a fragrant shell pink rose of excellent growth
5 : Radiance	: a good pink rose for cutting; growth is excellent; most blossoms in June
6 : Warrawee (Pat)	: a new shell pink rose; excellent growth; good in summer; fragrant

Yellow

1 : Golden Dawn	: continuous blooms of sunflower yellow; good, dwarf growth for bedding
2 : Golden Sastago	: clusters of pinkish yellow flowers; good growth
3 : Mrs. P.S. Dupont	: clusters of fragrant, golden yellow flowers; fade in the summer heat; productive
4 : Souer Therese	: daffodil yellow blossoms; excellent for bedding

Bicolor

Most of these roses are variable in their color and liable to fade in the heat of summer.

1 : Brazier	: a two-tone rose of good growth
2 : Condesa de Sastago	: blossoms are copper red inside, golden yellow outside; plants make excellent growth
3 : Pres. Herbert Hoover	: large, scarlet orange flowers; fragrant; good for cutting; excellent growth
4 : Radio	: small clusters of flowers marked with red appearing mostly in June and July; good growth

Table 7 (concl.)

Floribundas

This name has been given to a type of Hybrid Polyantha Rose that develops a larger bush than the Polyanthas, with larger flowers, yet keeping the prolific flowering and growth habits of the Polyantha. Rose breeders have recently emphasized this type considerably. They are grown in the border as a facer; in the formal garden in beds, as edgings, or small flowering hedges, or for cutting purposes. They bloom through most of the season.

Common Name	Remarks
1 : Gruss an Aachen	buds of orange pink open into orchid pink flowers; will grow in slight shade
2 : Karen Poulsen	clusters of single scarlet roses
3 : Elsie Poulsen	clusters of "apple blossom" pink flowers that are almost continuously blooming
4 : Poulsens Yellow	coffee yellow buds open into fragrant yellow blossoms

Polyanthaea

These are dwarf bushes, usually only 15-20" high. They are covered with clusters or sprays of small blooms during most of the season from early summer until frost. They are used in a manner similar to the floribundas and in addition, their small size fits them into the rock garden picture as well. Most polyanthas are quite hardy.

Common Name	Remarks
1 : Chatillion	: geranium pink flowers
2 : Catherine Zeimet	: flowers are pure white
3 : Ideal	: dark scarlet flowers are very showy

Chalkers

Most of these need a little help in the beginning of their climbing career in the form of adequate support and a little training. When this is provided, they may climb 15' or better and provide a lovely display on trellis or fence for screen or ornament. Most of them may provide cut flowers, too. They may have some flowers throughout the season but a maximum of flowers appear in May and June.

Common Name	Remarks
1 : American Pillar	immense, beautiful, single, pink flowers in clusters
2 : Blaze (Pat)	covered with masses of scarlet blossoms, especially in June; older plants bloom some through the summer
3 : Climbing Summer Snow	In June, a mass of clusters of white flowers with bright yellow stamens and intermittent blooms throughout the summer
4 : Doubloons (Pat)	a vigorous plant covered with clusters of large golden yellow flowers
5 : Dr. Van Fleet	large, fragrant, pale pink flowers; good for cutting
6 : Pauls Scarlet	an old favorite; clusters of bright scarlet flowers on strong, healthy plants

Table 8. Bulbs.

In general, bulbs may be planted in the perennial border, in bulb beds, allowed to attain full leaf growth to insure good blooms the following year. Given proper care, they can be grown throughout Kansas, if appropriate conditions of soil, moisture, and exposure are met.

among evergreens and shrubs, or naturalized in the grass. They should be

Given proper care, they can be grown throughout Kansas, if appropriate

Botanical Name	Common Name	Height	Use	Soil	Exposure	Color Bloom	Month Bloom	Remarks
1 : <i>Chionodoxa luciliae</i>	: Glory of the snow	: 6"	: Fl M R	: lt,w/dr	: sun,p/sh	: bl/wh	: Feb-Mar	: plant in October where undisturbed
2 : <i>Colchicum autumnale</i>	: Common autumn crocus	: 4"	: Fl M R	: lt,w/dr	: p/sh	: purple	: Sep-Oct	: foliage gone by June; blooms in fall
3 : <i>Crocus vernus</i>	: Common Crocus	: 5"	: Fl M R	: lt,w/dr	: sun,p/sh	: white	: Mar	: a true "herald of spring"
4 : <i>C. susianus</i>	: Clothofgold Crocus	: 5"	: Fl M R	: lt,w/dr	: sun,p/sh	: golden	: Mar	: a true "herald of spring"
5 : <i>Erythronium albidum</i>	: White Fawnlily	: 6"	: Fl R	: moist,rich	: sh,p/sh	: white	: Apr-May	: other colors in spp & HV's
6 : <i>Fritillaria imperialis</i>	: Imperial Fritillary	: 2-3"	: B Fl	: rich	: sun	: yellow/or	: Apr-May	: tall; protect from wind
7 : <i>Galanthus nivalis</i>	: Common Snowdrop	: 5"	: Fl M R	: moist	: sh,p/sh	: white	: Mar	: will grow under trees
8 : <i>Hyacinthus orientalis</i>	: Common Hyacinth	: 6-12"	: Fl M P	: a/g	: p/sh	: various	: Mar-Apr	: fragrant spikes
9 : <i>Leucojum aestivum</i>	: Summer Snowflake	: 12-18"	: B C F	: w/dr	: sun,p/sh	: white	: Apr	: spikes of drooping white flowers
10 : <i>Lilium candidum</i>	: Madonna Lily	: 2-4"	: B Fl	: a/g,w/dr	: sun	: white	: Jun-Jul	: group with lt. blue flowers
11 : <i>L. formosanum</i>	: Formosa Lily	: 4-5"	: B Fl	: a/g,w/dr	: sun	: white	: Jul-Aug	: bloom is pink on outside
12 : <i>L. philippinense</i>	: Philippine Lily	: 4-5"	: B Fl	: a/g,w/dr	: sun	: white	: Jul-Aug	: green throat
13 : <i>L. regale</i>	: Regal Lily	: 4-5"	: B Fl	: a/g,w/dr	: sun	: white	: Jun-Jul	: yellow throat; pink outside
14 : <i>L. speciosum</i>	: Speciosum Lily	: 4-5"	: B Fl	: r,w/dr	: sun	: various	: Aug-Sep	: recurved flower petals; good colors
15 : <i>L. tigrinum</i>	: Tiger Lily	: 4-5"	: B Fl	: a/g,w/dr	: sun	: orange	: Aug-Sep	: easily grown
16 : <i>L. umbellatum</i>	: Western Orange-cup Lily	: 3-4"	: B Fl	: a/g,w/dr	: sun	: orange/rod	: Jun-Jul	: several varieties
17 : <i>Lycoris radiata</i>	: Autumn Lycoris	: 2"	: Fl	: lt,w/dr	: p/sh	: lilac pink	: Aug	: foliage disappears before flowering
18 : <i>Muscari botryoides</i>	: Common Grapehyacinth	: 5"	: C Fl R	: a/g,w/dr	: sun,sh	: bl/wh	: Mar-Apr	: another "early bird"
19 : <i>Narcissus Jonquilla</i>	: Jonquil	: 8-10"	: B C Fl P	: w/dr	: sun,p/sh	: golden yl	: Apr	: flowers small; two or more per stem
20 : <i>N. poeticus</i>	: Poete Narcissus	: 6-8"	: C Fl N P	: r/dr	: sun,p/sh	: wht/scarlet	: Apr	: good for naturalizing
21 : <i>N. pseudonarcissus</i>	: Common Daffodil	: 6-8"	: C Fl P	: w/dr	: sun,p/sh	: various	: Mar-Apr	: many types
22 : <i>Scilla siberica</i>	: Siberian Squill	: 4-6"	: Fl R	: a/g	: sun,p/sh	: brt.blue	: Apr-May	: plant in groups
23 : <i>Tulipa</i> spp.	: Common Tulip	: 10-30"	: B C Fl P	: w/dr	: sun	: various	: Apr-May	: cut sparingly

(There are so many varieties of tulips and they are changing so much that it would be impractical to list even a representative group of named varieties. Consult a good bulb catalog.)

Table 9. Perennials.

	Botanical Name	Common Name	Height	Use
WL	1 : Achillea millefolium	Common Yarrow	18"	B C Fl N
	2 : A. ptarmica	Sneezewort Yarrow	18"	B C Fl N
	3 : Ajuga reptans	Carpet Bugle	6"	E Fl R
WL	4 : Althaea rosea	Hollyhock	72"	B Fl Sc
	5 : Alyssum saxatile	Goldentuft Alyssum	12"	B E Fl R
	6 : Anchusa azurea	Italian Bugloss	40"	B Fl
	7 : Anemone Japonica	Japanese Anemone	28"	B Fl N
*	8 : Aquilegia canadensis	American Columbine	20"	B C Fl R N
	9 : A. spp. & HV	Columbine	30"	B C Fl
*	10 : Arabis albida	Wall Rockcress	8"	B Fl R
*	11 : Asclepias tuberosa	Butterfly Milkweed	24"	B C Fl N
	12 : Aster spp. & HV	Hardy Aster	10-60"	B Fl N
*	13 : Baptisia australis	Blue Wildindigo	30"	B Fl N
*	14 : Boltonia asteroides	White Boltonia	65"	B Fl N
*	15 : Brunnera macrophylla	Brunnera	12"	B Fl
*	16 : Callirhoe involucrata	Low Poppymallow	6"	Fl R N
	17 : Campanula persicifolia	Peachleaf Bellflower	30"	B C Fl
	18 : Cerastium tomentosum	Snow-in-summer	6"	B E Fl
	19 : Ceratostigma plumbaginoides	Blue Ceratostigma	10"	B Fl Gr
	20 : Chrysanthemum spp & HV	Hardy Chrysanthemum	12-28"	B C Fl
	21 : C. coccineum	Florists Pyrethrum	18"	B C Fl
	22 : C. maximum HV	Shasta Daisy	20"	B C Fl
*	23 : Coreopsis lanceolata	Lance Coreopsis	24"	B C Fl
	24 : Daphne cneorum	Rose Daphne	14"	B E Fl Fo R
	25 : Delphinium spp & HV	Larkspur	60"	B C Fl
	26 : Dianthus barbatus	Sweetwilliam	14"	B C Fl
	27 : D. plumarius	Grass Pink	10"	B C Fl E R
	28 : Dicentra spectabilis	Common Bleedingheart	28"	B Fl
*	29 : Echinacea purpurea	Purple Echinacea	36"	B C Fl
*	30 : Echinops ritro	Small Globethistle	36"	B Fl N
*	31 : Eupatorium coelestinum	Mistflower Eupatorium	20"	B C Fl N
*	32 : Gaillardia aristata	Common Perennial Gaillardia	18"	B C Fl N
	33 : Gypsophila paniculata	Babysbreath	30"	B C Fl
	34 : G. repens	Creeping Gypsophila	6"	Fl E R
WL	35 : Heliumum autumnale	Common Sneezeweed	36"	B C Fl N
WL	36 : Helianthus decapetalus	Thinleaf Sunflower	60"	B C Fl
*WL	37 : H. maximiliani	Maximilian Sunflower	60"	B C Fl
	38 : Hemerocallis flava	Lemon Daylily	28"	B C Fl
	39 : Heuchera sanguinea	Coralbells	16"	B C Fl R
WL	40 : Hibiscus palustris	Common Rosemallow	48"	B Fl
	41 : Houttuynia cordata	Blue Plantainlily	20"	B Fl
	42 : H. plantaginea	Fragrant Plantainlily	20"	B Fl
	43 : Iberis sempervirens	Evergreen Candytuft	10"	E Fl Fo P R
	44 : Iris germanica	German Iris	30"	B C Fl
	45 : I. pumila	Dwarf Iris	8"	E Fl R N
	46 : I. sibirica	Siberian Iris	28"	B C Fl

Soil	Exposure	Color Bloom	Month Bloom	Remarks
g .	sun	white	May-Jul	dainty fine foliage; erect; HV
g .	sun	white	May-Jul	dainty fine foliage; erect; HV
g .	p/sh,sh	blue	May-Jun	flowers in spikes; creeps
g, w/dr	sun	various	Jun-Oct	coarse texture; erect
g .	sun	yellow	Mar-Apr	good edging plant; clump
g, w/dr	p/sh	blue	May-Jul	good bloomer; coarse foliage
g .	p/sh,sh	various	Sep-Oct	protect from drying winds; HV
g .	sun, p/sh	yel & red	May-Jul	a lovely native plant
g .	p/sh	various	May-Jun	many colors
g .	sun, p/sh	white	Apr-May	showy clumps
g, dry	sun	orange	Jun-Jul	showy flowers; long taproot
g .	sun, p/sh	various	Jun-Oct	many kinds—blue, pink, white
g/dr	sun	blue	May-Jun	bushy; pea-like flowers
g .	sun	white	Aug-Sep	aster-like flowers
g .	sun, p/sh	blue	Apr-May	old name—Anchusa
g .	sun, p/sh	crimson	May-Sep	best in the rock garden
g .	sun, p/sh	blue	Jun-Jul	upright plant; bell-like flowers
g .	sun	white	May-Jun	creeping habit; silvery leaves
g .	sun	blue	Aug-Oct	vigorous growth; spreads rapidly
g, w/dr	sun	various	Aug-Nov	many kinds; among nicest fall flowers
g, w/dr	sun, p/sh	various	May-Jun	daisy-like flowers
g .	sun	white	Jun-Aug	daisy-like flowers; transplant yearly
g .	sun, p/sh	yellow	Jun-Sep	fine foliage; self-seeds
g, w/dr	sun	rose, pk	Apr-Sep	evergreen foliage; fragrant flowers
g .	sun, p/sh	blue	Jun-Sep	use in background
g .	sun	various	May-Jun	clusters of small flowers
g .	sun	various	May-Jun	very fragrant
g .	p/sh, sh	pink	Apr-May	pendant flowers
g .	sun	rose-purp	Jul-Aug	old name—Judbeckia
g, w/dr	sun	blue	Jun-Jul	spiny; self-seeds
g .	p/sh	blue	Sep-Oct	flowers like ageratum
g, w/dr	sun	yel/rod	May-Oct	blooms all summer
g .	sun	white	Jun-Jul	festucrea mass of small flowers
g .	sun	white	May-Jun	a dainty dwarf
g .	sun	yellow	Aug-Sep	good tall plant for fall
g .	sun	yellow	Jul-Aug	many HV's including doubles
g .	sun	gold	Sep-Oct	a rugged plant for background
g, m	sun, sh	yellow	May-Jul	many varieties of various colors
g, m	sun, p/sh	red	May-Jul	ornamental foliage; small flowers
g, m	sun, p/sh	pink	Jun-Oct	large, showy flowers
g, m	p/sh, sh	blue	May-Jul	thick clump of shiny leaves; old name Funkia
g, m	p/sh, sh	white	Aug-Sep	thick clump of shiny leaves; old name Funkia
g .	sun	white	Apr-Jun	shrubby and evergreen
g .	sun	purple	Apr-Jun	old, but good
g, w/dr	sun	various	Mar-Apr	a fine "miniature"
g, wet	p/sh, sh	various	May-Jun	margins of pools—roots out of water

Table 9 (concl.)

Botanical Name	Common Name	Height	Use	Soil	Exposure	Bloom	Bloom	Remarks
* 47 : <i>Liatris pycnostachya</i>	Kansas Gayfeather	: 40"	: B C Fl N	: a/g	: sun, p/sh	: rosy purp	: Jul-Sep	: tall spikes of foliage and flowers
48 : <i>Linum perenne</i>	Perennial Flax	: 14"	: B Fl R	: a/g	: sun	: blue	: May-Sep	: dainty flowers and foliage
* 49 : <i>Lobelia cardinalis</i>	Cardinalflower	: 36"	: Fl Cr N	: a/g, m	: p/sh	: brt. red	: Jul-Sep	: plant near water
50 : <i>Lupinus polyphyllus</i>	Washington Lupine	: 40"	: B C Fl G	: m,w/dr	: sun	: various	: Jun	: long, showy spikes of flowers
* 51 : <i>Mertensia virginica</i>	Virginia Bluebells	: 18"	: B Fl G R	: a/g, m	: p/sh, sh	: blue	: Apr-May	: nodding clusters of flowers
52 : <i>Nepesta mussini</i>	Persian Nepeta	: 12"	: B Fl R	: a/g	: sun, p/sh	: blue	: May-Sep	: prostrate plants
* 53 : <i>Oenothera missouriensis</i>	Ozark Sundrops	: 10"	: B Fl R N	: a/g	: sun	: yellow	: May-Jun	: large golden flowers; small plant
54 : <i>Paeonia officinalis</i> NV	Common Peony	: 30"	: B C Fl M	: a/g, w/dr	: sun	: various	: May-Jun	: fits many situations; large flowers
55 : <i>Papaver nudicaule</i>	Iceland Poppy	: 12"	: B C Fl M	: a/g	: sun	: various	: May-Aug	: keep well picked
56 : <i>P. orientale</i>	Oriental Poppy	: 36"	: B C Fl M	: a/g	: sun	: scarlet	: May-Jun	: brilliant color; cut as buds open
57 : <i>Pentstemon torreyi</i>	Torrey Penstemon	: 36"	: B C Fl	: a/g, w/dr	: p/sh	: scarlet	: Jun-Jul	: need loose soil and moisture
* 58 : <i>Phlox divaricata</i>	Sweet William Phlox	: 12"	: B Fl N	: w/dr, m	: sun	: blue	: Apr-May	: flowers in clusters
59 : <i>P. paniculata</i>	Summer Phlox	: 30"	: B C Fl M	: r, m	: sun, p/sh	: various	: Jun-Jul	: many HV's; mulch to conserve moisture
60 : <i>P. subulata</i>	Moss Phlox	: 6"	: B E Fl R	: a/g	: sun	: various	: Mar-Apr	: spreading habit; profuse bloomer
* 61 : <i>Physostegia virginiana</i>	Virginia Lionsheart	: 30"	: B C Fl	: a/g, m	: sun, sh	: various	: Jul-Sep	: pink, lilac, & white flowers in August
62 : <i>Platycodon grandiflorum</i>	Balloonflower	: 20"	: B C Fl	: a/g, w/dr	: sun, p/sh	: blue/white	: Jun-Aug	: erect; buds like balloons
* 63 : <i>Ranunculus repens</i>	Creeping Buttercup	: 10"	: B Fl R N	: a/g	: sun, p/sh	: yellow	: May-Jul	: low creeping plant
* 64 : <i>Salvia pitcheria</i>	Pitchers Sage	: 20"	: B Fl M	: a/g	: sun	: dk/blue	: Aug-Sep	: provide some winter protection
* 65 : <i>Sanguinaria canadensis</i>	Bloodroot	: 6"	: B E Fl R	: a/g	: sh, p/sh	: white	: Mar-Apr	: flowers before foliage appears
66 : <i>Santolina chamaecyparissus</i>	Cypress Lavendercotton	: 16"	: B Fl Po	: a/g	: sun	: yellow	: Jun-Jul	: gray, evergreen leaves; half hardy
67 : <i>Saponaria ocymoides</i>	Rock Soapwort	: 6"	: E Fl R	: a/g	: sun, p/sh	: pink	: May-Aug	: low spreading plant
68 : <i>Scabiosa caucasica</i>	Caucasian Scabious	: 24"	: B C Fl	: a/g, w/dr	: sun	: blue/wh	: Jun-Sep	: long stems
69 : <i>Sedum spectabile</i>	Showy Stonecrop	: 18"	: B Fl R	: a/g, w/dr	: sun, p/sh	: pink	: Jun-Sep	: profuse bloomer; many smaller species
* 70 : <i>Solidago rigida</i>	Stiff Goldenrod	: 36"	: B C Fl N	: a/g, w/dr	: sun	: yellow	: Aug-Sep	: drought resistant
71 : <i>Stokesia laevis</i>	Stokesia	: 18"	: B C Fl	: a/g, w/dr	: sun	: various	: Jun-Oct	: avoid heavy soils
72 : <i>Thalictrum aquilegifolium</i>	Columbine Meadowrue	: 36"	: B C Fl Po	: a/g, w/dr	: p/sh, sh	: various	: May-Jun	: feathery flowers; foliage like columbine
* 73 : <i>Tradescantia virginiana</i>	Virginia Spiderwort	: 20"	: B Fl N	: a/g, m	: sun, p/sh	: blue	: May-Aug	: use in naturalistic plantings
74 : <i>Tunica saxifraga</i>	Saxifrage Tunicflower	: 7"	: E Fl R	: a/g	: sun	: pink	: Jun-Sep	: dense foliage; fine texture
75 : <i>Veronica spicata</i>	Spike Speedwell	: 18"	: B C Fl	: a/g	: sun	: pk/wh	: May-Sep	: long spikes of flowers
76 : <i>Vinca minor</i>	Common Periwinkle	: 7"	: Fl Po Cr	: a/g	: p/sh, sh	: blue	: Apr-May	: good ground cover in shade
77 : <i>Viola cornuta</i>	Horned Violet	: 6"	: C Fl E R N	: a/g	: p/sh	: various	: Apr-Nov	: many HV's
78 : <i>V. odorata</i>	Sweet Violet	: 6"	: C Fl R N	: a/g	: p/sh	: violet	: Apr-Jun	: fragrant

Table 10. Annuals.

Botanical Name	Common Name	Height	Use
1 : <i>Ageratum houstonianum</i>	: Mexican Ageratum	: 12"	: Be Fl E P :
2 : <i>Antirrhinum majus</i>	: Common Snapdragon	: 30"	: B Be C Fl :
3 : <i>Arctotis stoechadifolia</i>	: African Arctotis	: 24"	: B C Fl :
4 : <i>Brachycome iberidifolia</i>	: Swanrivedaisy	: 12"	: C E Fl P :
5 : <i>Calendula officinalis</i>	: Potmarigold Calendula	: 24"	: Be C Fl P :
6 : <i>Callistephys chinensis</i>	: Common China-Aster	: 24"	: C Fl :
7 : <i>Celosia argentea</i>	: Feather Cockscomb	: 36"	: B Fl :
8 : <i>C. argentea cristata</i>	: Common Feather Cockscomb	: 24"	: B Fl :
9 : <i>Centaurea cyanus</i>	: Cornflower	: 24"	: B C Fl M :
10 : <i>C. imperialis</i>	: Royal Centaurea	: 30"	: B C Fl M :
11 : <i>C. moschata</i>	: Sweetsultan	: 24"	: B C Fl M :
12 : <i>Cobaea scandens</i>	: Purplebell Cobaea	: 30'	: V T :
13 : <i>Coreopsis drummondii</i>	: Goldenwave Coreopsis	: 18"	: B C Fl :
* 14 : <i>C. tinctoria</i>	: Plains Coreopsis	: 36"	: B C Fl :
15 : <i>Cosmos bipinnatus</i>	: Common Cosmos	: 48"	: B C Fl :
16 : <i>C. sulphureus</i>	: Yellow Cosmos	: 36"	: B C Fl :
17 : <i>Cuphea platycentra</i>	: Cigarflower Cuphea	: 18"	: Be Fl :
18 : <i>Dahlia</i> spp & HV	: Dahlia	: 3-6'	: B C Fl :
19 : <i>Delphinium ajacis</i>	: Rocket Larkspur	: 24"	: B C Fl :
20 : <i>Dianthus caryophyllus</i>	: Clove Pink; Carnation	: 18"	: B C Fl :
21 : <i>D. chinensis</i>	: Chinese Pink	: 12"	: B C Fl :
22 : <i>Dimorphotheca aurantiaca</i>	: Winter Capemarigold	: 12"	: B Fl :
WL 23 : <i>Eschscholtzia californica</i>	: California Poppy	: 12"	: B Be Fl :
*WL 24 : <i>Gaillardia pulchella picta</i>	: Painted Gaillardia	: 18"	: B Be C Fl :
25 : <i>Gilia capitata</i>	: Globe Gilia	: 18"	: B Fl R :
26 : <i>Gomphrena globosa</i>	: Common Globeamaranth	: 24"	: B Be C Fl :
27 : <i>Gypsophila elegans</i>	: Common Gypsophila	: 12"	: B C Fl :
28 : <i>Helianthus debilis</i>	: Cucumberleaf Sunflower	: 40"	: B C Fl :
29 : <i>Helichrysum bracteatum</i>	: Strawflower	: 30"	: B C Fl M :
30 : <i>Helipterum manglesii</i>	: Mangles Sunray	: 15"	: Fl :
31 : <i>H. roseum</i>	: Rose Sunray	: 15"	: B Fl :
32 : <i>Hibiscus manihot</i>	: Sunset Hibiscus	: 72"	: B Fl :
33 : <i>Humulus japonicus</i>	: Japanese Hop	: 25'	: V Fo T :
34 : <i>Hunnemannia fumariaefolia</i>	: Golden Cup	: 24"	: B C Fl :
35 : <i>Iberis amara</i>	: Rocket Candytuft	: 18"	: E Fl :
36 : <i>I. umbellata</i>	: Globe Candytuft	: 18"	: E Fl :
* 37 : <i>Impatiens balsamina</i>	: Garden Balsam	: 20"	: B Fl P :
* 38 : <i>Ipomoea purpurea</i>	: Common Morning-glory	: 15'	: V Fl T :
39 : <i>Kochia scoparia</i>	: Belvedere Summerscypress	: 23"	: H :
40 : <i>Lantana camara</i>	: Common Lantana	: 24"	: B Fl E H P :
41 : <i>Lathyrus odoratus</i>	: Sweet Pea	: 72"	: V Fl :
42 : <i>Linum grandiflorum</i>	: Flowering Flax	: 18"	: B Fl G R :
43 : <i>Lobelia erinus</i>	: Edging Lobelia	: 6"	: Be Fl E P :
44 : <i>Lobularia maritima</i>	: Sweetalyssum	: 8"	: Ba Fl E :
45 : <i>Lochnera rosea</i>	: Madagascar-periwinkle	: 15"	: Be Fl E P :
46 : <i>Lupinus hirsutus</i>	: European Blue Lupine	: 24"	: B C F :

Soil	Exposure	Color	Month Bloom	Month Bloom	Remarks
/g	: sun, p/sh	: blue & wh	: Jul-Oct	: keep old flowers picked	
/g	: sun, p/sh	: various	: Jul-Oct	: use rust resistant varieties	
/g	: sun	: white	: Jul-Sep	: daisy-like flowers; other kinds & colors	
/g	: sun	: various	: Sep-Oct	: keep old blooms picked	
/g, n	: sun, p/sh	: gold	: Jun-Oct	: responds to water and care	
/g	: sun, p/sh	: various	: Jul-Oct	: require good care; disease resistant strains	
/g	: sun	: rd, pk/yel	: Aug-Oct	: coarse; use sparingly	
/g	: sun	: rd & yel	: Aug-Oct	: coarse; use sparingly	
/g	: sun	: various	: Jun-Jul	: old favorite	
/g	: sun, p/sh	: various	: Jun-Jul	: deeply lobed, gray foliage	
/g	: sun, p/sh	: various	: Jun-Jul	: large fringed flowers	
/g	: sun	: purple	: Jul-Sep	: vine; climbs by tendrils	
/g	: sun	: yellow	: Jul-Sep	: large blossoms	
/g	: sun	: yl dk, eye	: Jul-Sep	: bright, two-tone blossoms	
/g	: sun	: various	: Jul-Oct	: tall; needs staking; space 18" apart	
/g	: sun	: or/yel	: Jun-Oct	: do not fertilize or over-water	
/g	: sun, p/sh	: brt/red	: Jul-Oct	: interesting flowers	
/g	: sun, p/sh	: various	: Jul-Sep	: needs protection from wind	
/g	: sun, p/sh	: various	: Jun-Jul	: large single spikes of flowers	
/g, w/dr	: sun	: various	: Jul-Oct	: good for summer flowers	
/g, w/dr	: sun	: various	: Jul-Oct	: may live over to second year	
/g, w/dr	: sun	: orange	: Jul-Sep	: profuse bloomer	
/g, w/dr	: sun	: various	: Jun-Sep	: state flower of California	
/g, w/dr	: sun	: yel/prp	: Jun-Oct	: blooms late in fall	
/g	: sun	: blue	: May-Jul	: best Gilia for hot weather	
/g	: sun	: various	: Jul-Sep	: also for winter bouquets	
/g	: sun	: wh/pk	: Jun	: prefer limestone soil	
/g	: sun	: yellow	: Jul-Sep	: best annual sunflower	
/g	: sun	: various	: Jul-Sep	: also for winter bouquets	
/g	: sun	: pk/wh	: Jun-Sep	: also for winter bouquets	
/g	: sun	: rose	: Jun-Sep	: also for winter bouquets	
/g	: sun	: yellow	: Jul-Sep	: unusual; large plant and flowers	
/g	: sun	: *	: —	: vino; dense foliage; rapid growth	
/g	: sun	: yellow	: Sep-Oct	: good fall flower	
/g	: p/sh	: white	: Jun-Aug	: long flower heads	
/g	: p/ch	: rose/prp	: Jun-Aug	: short flower heads	
/g, dr	: sun	: various	: Jun-Sep	: tender juicy stems	
/g	: sun, p/sh	: various	: Jun-Oct	: vine; rapid growth; named vars. best	
/g	: sun	: *	: —	: remove plants before seed sets	
/g	: sun	: various	: May-Oct	: clusters of flowers on shrubby plant	
w/d, m	: sun, p/sh	: various	: May-Jul	: responds to care; many HV's	
/g	: sun	: red	: Jun-Oct	: blooms late in fall	
/g	: p/sh	: wh/blue	: Jun-Oct	: does not like hot summers	
/g	: sun	: white	: Jun-Oct	: profuse bloomer; plant late for fall flowers	
/g	: sun	: wh/pink	: Jun-Oct	: old name—Vinca rosea	
/g	: p/sh	: blue	: Jun-Jul	: add peatmoss to soil	

Table 10 (concl.)

Botanical Name	Common Name	Height	Use	Soil	Exposure	Color Bloom	Month Bloom	Remarks
47 : Matthiola incana annua	Annual Stock	: 18"	: B C Fl	r, m	: p/sh	: various	: Jun-Aug	: fragrant; may act as biennial
48 : Mirabilis jalapa	Common Four-o'clock	: 24"	: Bc Fl H	a/g	: sun	: various	: Jul-Oct	: old-fashioned but good
49 : Monardica balsamina	Balsam-pink	: 15"	: V Fl Fo Fr	a/g	: sun, p/sh	: yellow	: Jul-Aug	: vine; bright orange fruit
50 : Nicotiana alata	Winged Tobacco	: 30"	: B Fl	a/g	: sun, p/sh	: various	: Jun-Oct	: fragrant flowers
51 : Nigella damascena	Love-in-a-mist	: 12"	: B C Fl	a/g	: sun, p/sh	: wh, lt bl	: Jun-Oct	: interesting flowers
52 : Papaver rhoeas	Corn Poppy	: 18"	: B Be C Fl	a/g	: sun	: various	: May-Jun	: cut in bud
53 : P. somniferum	Opium Poppy	: 20"	: B Be C Fl	a/g	: sun	: various	: May-Jun	: cut in bud; pick off pods
54 : Petunia hybrida	Common Petunia	: 12"	: B Be C Fl P	a/g	: sun, p/sh	: various	: Jun-Oct	: profuse bloomer; most useful annual
WL 55 : Phlox drummondii	Drummond Phlox	: 12"	: B C E Fl R	a/g, w/dr	: sun	: various	: May-Oct	: keep old flowers picked
56 : Portulaca grandiflora	Common Portulaca	: 6"	: E Fl R P	dry	: sun	: various	: Jun-Oct	: brilliant colors
57 : Reseda odorata	Common Mignonette	: 12"	: C Fl P	a/g	: p/sh	: yl, wh	: Jun-Sep	: fragrant flowers
WL 58 : Ricinus communis	Castor-bean	: 3-10'	: Fo H Sc	a/g	: sun	: n	: —	: seeds contain a poison!
59 : Rudbeckia bicolor	Pinewood Coneflower	: 24"	: B C Fl	a/g	: sun	: yellow	: Jun-Oct	: flower has brown cone-shaped center
60 : Salpiglossis sinuata	Scalloped Salpiglossis	: 24"	: B C Fl	a/g, w/dr	: p/sh	: various	: Jun-Oct	: many rich colors
61 : Salvia splendens	Scarlet Sage	: 20"	: B Fl P	a/g	: sun	: scarlet	: Jul-Sep	: dazzling color
62 : Sanvitalia procumbens	Trailing Sanvitalia	: 6"	: B Be E Fl	a/g	: sun	: yellow	: Jun-Oct	: tiny, zinnia-like flowers
63 : Scabiosa atropurpurea	Sweet Scabious	: 24"	: B C Fl	a/g	: p/sh	: various	: Jul-Oct	: keep old flowers picked
64 : Tagetes erecta	Aztec Marigold	: 30"	: B Be C Fl	a/g, w/dr	: sun	: yel/orange	: Jun-Oct	: a good hardy annual
65 : T. patula	French Marigold	: 12"	: B Be C Fl P	a/g, v/dr	: sun	: yel/rd eye	: Jun-Oct	: compact plant; good for edging
66 : T. tenuifolia	Striped Marigold	: 12"	: B Fl E	a/g, w/dr	: sun	: golden	: Jun-Oct	: less odoriferous
67 : (Thymophyllum tenuiloba)	(Dahlberg Daisy)	: 8"	: Fl E R	a/g	: sun	: yellow	: Jul-Oct	: a real miniature
68 : Tithonia rotundifolia	Scarlet tithonia	: 6"	: C Fl Sc	a/g	: sun	: or/scarlet	: Aug-Oct	: use in background
69 : Torenia fournieri	Blue Torenia	: 12"	: Fl P R	a/g, m	: p/sh	: blu/gold	: Jul-Sep	: drought resistant; dainty
70 : Tropaeolum majus	Common Nasturtium	: 15"	: V Be C Fl T	poor	: sun, p/sh	: yl to rd	: Jun-Oct	: vine; blooms more in poor soil
71 : Tropaeolum minus	Rush Nasturtium	: 12"	: B Be C E Fl	poor	: sun, p/sh	: various	: Jun-Oct	: keep old flowers picked
72 : Verbena sp (hybrida)	Garden Verbena	: 12"	: B Be C Fl Cr P	a/g	: sun	: various	: Jun-Oct	: one of best annuals; pinch
73 : Viola tricolor hortensis	Garden Pansy	: 8"	: Be C Fl	r, m	: p/sh	: various	: May-Jul	: old favorite; responds to care
74 : Zanthoxylum americanum	Star-of-Texas	: 14"	: B E Fl R	a/g, dry	: sun	: yellow	: Jul-Sep	: likes sunny, dry location
75 : Zinnia elegans	Common Zinnia	: 30"	: B Be C Fl	a/g	: sun	: various	: Jun-Oct	: one of best annuals; also dwarfs
76 : Z. haageana	Orange Zinnia	: 18"	: B Be C E Fl R	a/g	: sun	: orange	: Jun-Oct	: one of best annuals; many varieties

Key to abbreviations

Abbreviations found in Plant Lists

WL - suitable for wildlife planting * - plants native to Kansas

HV - horticultural varieties ** - inconspicuous flowers

Use

A - autumn color

Gr - ground cover

Ac - accent

H - hedge

B - shrub or perennial border

M - mass plantings, large groups

Ba - banks, to cover and hold slopes

N - naturalistic plantings

Be - bedding effect—as a rose bed

P - pot plant

Br - barrier

R - rock garden

C - cut flowers

Sc - screen for unsightly views

E - edging for flower beds

Sh - shade tree

F - foundation planting

St - street tree

Fa - "facer" in front of taller shrubs

T - trellis

Fl - attractive flowers

V - vine

Fo - attractive foliage

W - windbreak

Fr - colorful fruit

Wa - capable of holding on to a wall

G - plant in groups

Exposure

s - full sunlight

Soil

a/g - any good soil

sh - shade

r - rich

p/sh - partial shade

d - dry

we - wet

m - moist

p/m - partially moist

w/dr - well drained

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